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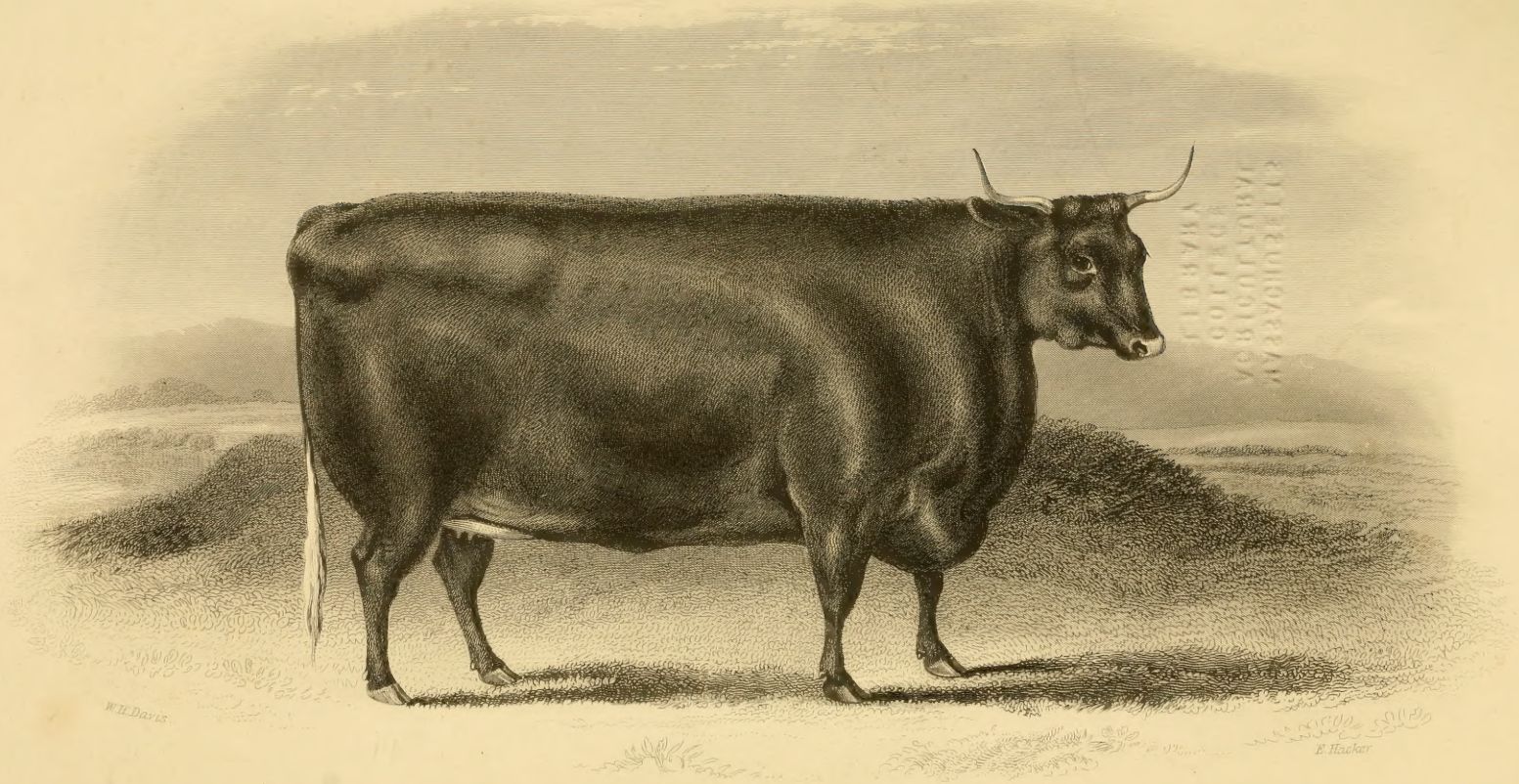

A Devon Cow.

The Property of John Hudson Esq.ᵉ of Castle Acre, Norfolk, for which the First Prize of £20 and Silver Medal as the Breeder, were awarded at the Smithfield Club Cattle Show, Dec.ʳ 1854.

London. Published by Rogerson & Tuxford, 246, Strand, 1855.

THE FARMER'S MAGAZINE.

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VOLUME THE EIGHTH.

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THE FARMER'S MAGAZINE.

JULY, 1855.

PLATE I.

DEVON COW,

THE PROPERTY OF JOHN HUDSON, ESQ., OF CASTLE ACRE, NORFOLK.

The subject of our first Plate—a Devon Cow, for which the first Prize and the silver Medal were awarded at the Smithfield Club Cattle Show in December last—was the property of John Hudson, Esq., of Castle Acre, Norfolk; and when exhibited was four years and ten months old, and had produced two calves. This animal also took the first Prize in June, 1852, at the Norfolk Agricultural Show, as an incalf heifer. The dead weight of this animal was 105 stones, (8 lbs. to the stone,) and 17 stones of fat. Her mother was also a first class animal, and took four Prizes in four successive years at the same show—in fact, she was never beaten.

PLATE II.

VIRAGO.

Virago, bred by the late Mr. R. Stephenson in 1851, was got by Pyrrhus the First, out of Virginia, by Rowton.

Virago is a yellow chesnut filly, standing fifteen hands three-and-a-half inches high. She has rather a coarse, but still good head, straight neck, splendid shoulders, and great depth of girth. She has a good back and ribs, very wide hips, with great length from hip to hock, and thence short to the ground. She has good hocks, knees, and joints, and has, in fact, many very fine points, though more a racing-looking than very handsome mare. In temper she is remarkably quiet and docile.

THE CRIMSON CLOVER.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

Some recent trials, with the *Trifolium incarnatum*, or crimson clover, have led to the conclusion that it may be made more extensively useful to the owners of live stock than at present.

Many of us remember its fate when first tried, nearly a quarter of a century since—how it generally failed, and how very striking were its mass of rich crimson blossoms in those fields where it did succeed; such places, however, being commonly those where the farmer had bestowed the least labour, where he had without the aid of the plough, merely scarified the surface, or harrowed its seeds upon the hard stubble lands. A neighbour of mine in Essex, who, like many others, un-

wittingly lost his crimson clover by over-kindness, remarked, with a very natural surprise, that by the side and upon the hard ridges in a field road, the trifolium was a capital crop; but where he had carefully ploughed, and pulverized the soil, the crop was worthless. The same remark was made in almost all parts of England. The Rev. W. Thorp, of Pontefract, when describing the results obtained by the farmers of the West Riding, observes (*Jour. Roy. Ag. Soc.* vol. iii., *p.* 336): "This would be an invaluable plant, but it invariably dies in winter, if sown upon land recently ploughed, which it is usually sown upon; while if the stubble land before sowing be merely scratched by light harrows, and, after sowing, compressed with a heavy roller, it will stand the winter."

From the above observations the trifolium rapidly became neglected. Since this, however, its superior nutritive properties have been ascertained by Dr. Anderson, and not long since the Highland Society of Scotland awarded its gold medal to Mr. James Fulton, an Ayrshire farmer, for his report of a series of valuable trials with this plant, which he evidently deems very valuable as an intermediate or stolen crop.

The chemical investigations of Professor Anderson, upon the nutritive properties of the trifolium, were the more valuable since they were not confined to one description of clover. He tells us, in his concluding remarks (and these will render the following table more useful to many of my readers), that "a comparison of these analyses indicates a considerable difference in the nutritive value of the different samples. This is particularly seen when we compare the proportions of solid matters and of nitrogen they contain, which may be considered as affording a pretty fair criterion of their value as food; the former indicating the total amount of all the nutritive matters present; the latter giving of course the quantity of nitrogenous matters, which are by much the most important, so much so indeed, that some distinguished chemists have even conceived that the other constituents may be neglected in determining the relative nutritive values of different substances." "The crimson clover," he remarked in another page, "is a very valuable species, and surpasses any of the other specimens analyzed, the amount of nitrogen being higher than any obtained from the other plants, and considerably above the average of the whole." (*Trans. High. Soc.*, 1852, pp. 443-447.)

In the following table will be found the amount of some of the substances obtained by Dr. Anderson, from 100 parts (in the green state)—of I., the crimson clover; II., of red clover; III., of cow grass; IV., of lucern; V., of yellow clover:—

	I.	II.	III.	IV.	V.
Water	82.56	85.30	81.76	80.13	77.38
Dry residue yielding..	17.44	14.70	18.24	19.87	22.62
Ash	1.88	1.30	1.92	2 49	2.02
Nitrogen	0.52	0.37	0.51	0·49	0.56

The experiments of Mr. Fulton, upon various modes of growing the crimson clover, extended from 1852 nearly to the present period. The soils on which they were made he describes (*ibid,* 1855, p. 460) as of a dry, free nature, of medium fertility, resting on the carboniferous sandstone, and about eighty feet above the sea. In some of his trials, the seed was sown in May, and these, in their results, he found fully maintained the character of the crimson clover, as a plant of quick growth and of large return. But in this paper, I propose to chiefly direct my attention to the crops of it which were obtained in Ayrshire, from seed sown in July and August, since these may be more useful to many of my readers, who may at this season take a hint from Mr. Fulton, and repeat some of his expriments. "The object of one of these trials," he tells us, "perhaps of the most economic interest, was the growing of it as a secondary crop, after early or green sale potatoes. The mode of cultivation was this: the land being cleared of the potatoe-stalks, 2 cwt. of Peruvian guano, and half cwt. of nitrate of soda, were laid on, and wrought into the soil by a tine of the grubber; the seed was then sown and harrowed, and rolled—this was done on the 17th of July, 1852; *this appears*, he continues, to be *the most genial season* of the year for the growth of crimson clover. This experiment was conducted, especially in the early part, under very favourable meteorological conditions. The braird came up on the third day, and grew so rapidly from the very first, that it covered the ground in a very short space of time. The weight was taken on the 17th of October, (three months after the date of sowing,) and found to weigh 21½ tons the imperial acre. In this experiment the crimson clover grew more into foliage, and showed much less tendency to flower than in other trials. Three months after it was sown, and when it had attained to the height of three feet, a few flower-buds only appeared, which never came fully into bloom. Other phenomena, worthy of notice in this experiment, were the extraordinary power of resisting frost, free radiation, and the remarkable succulent condition of the *trifolium*, which may account for the surprising weight of the crop. Its radiating power, to which its immunity from the effects of frost is probably due, were very conspicuous in dewy and frosty mornings. In the former, the clover was bent down by the deposit of dew, which was much heavier than on other plants; and in the latter it was so densely covered with hoar, as to appear like a fall of snow.

It maintained its fresh succulent condition in the month of October, during the remarkably cold dry atmosphere and withering winds which then prevailed, and which so severely tried the hardest of our cultivated and indigenous plants."

"The sixth experiment," adds Mr. Fulton, "was as an intermediate or stolen crop, between a corn and a succeeding turnip crop. As soon as the wheat could be cleared off the land, about 12½ tons of a mixture of farm-yard and rich ash manure from a neighbouring village, were spread on the stubble, and incorporated with the surface of the soil by the grubber, which was employed to clean and pulverize the soil to about three or four inches. The seeds (crimson clover 18lbs., and ¾ bushel of rye) were sown on the 21st of August, and to prevent dragging, was covered with an open-tined harrow. A turn of the roller was next given to compress the soil, and smooth down the stubble and other light matters lying on the surface. A thick fresh braird came up on the 25th, and genial weather still prevailing, it made progress so fast, that by the middle of October it had attained the height of five, and in some parts six inches; it kept green, and covered the ground until a late period in winter."

The conclusions arrived at from the result of these experiments are thus summed up by Mr. Fulton: "That crimson clover produces an excellent quantity of forage, of which all the live stock of the farm, including sheep and pigs, are very fond, and on which they do well. That it is easy of cultivation in summer, coming forward to the scythe in ten or twelve weeks after being sown, or sooner if wanted for pigs; but except on very clean land, it will not answer so well as vetches. That it will be quite possible to grow it as an intermediate or stolen crop, between a corn and turnip crop, provided it can be got into the ground by the middle or before the end of August, and that the autumn be favourable for bringing it forward. Its success seems to depend solely on this; for it can stand severe weather, if it is well established before the winter sets in. That although it resists the keenest frosts, vegetation progresses but slowly at low temperatures. That to bring it early forward for cutting, it will require to be stimulated in spring with liberal dressings of manure, which are in some measure an equivalent for temperature; yet the result of the experiment where no manure was applied goes to prove that it is less influenced by manure than other conditions; the effects of the manure, at any rate, will extend to the turnip crop. That while it is perhaps the best known intermediate crop to precede a turnip crop, from its non-exhausting and favourable mechanical effects, there are others that may be substituted which will yield fully as certain, and more bulky returns. That as a secondary crop after early or green sale potatoes, crimson clover is highly entitled to a place amongst our cultivated plants, as it places within the reach of the grower a simple means of extracting another crop from the land, and of renovating the soil after the deteriorating effects of that disordering, if not searching crop."

Such have been some of the practical and scientific labours lately bestowed upon the crimson clover, a crop which once extensively tried by the English farmers as generally failed, perhaps more from our ignorance of the habits, than from any want of merit in the plant. The trials of Mr. Fulton, a practical Scotch farmer, which I have described chiefly in his own language may I think be advantageously extended in many English parishes. Such efforts are in a very important direction. Any suggestions indeed, for the improvement of the supply of green food, will be certain to ensure the earnest attention of those who have been long making such great and successful attempts to increase the number of their live stock, efforts now so imperatively called forth, and which must in some way or other be made to succeed, in order that the demands for animal food may be satisfied of a largely increasing and meat-consuming population.

PROVIDING WINTER AND EARLY SPRING KEEP FOR LIVE STOCK.

When we consider that the improving condition of a farm greatly depends upon the amount of live stock kept upon it, and that the number of its living manufacturers of manure is mainly limited by the quantity of food raised and preserved for their winter and spring sustenance, we see the importance of having an ample store of early spring keep, and the heavy disadvantage of a season like that just past. Ordinary crops of roots have hardly been eked out through a season attenuated beyond all expectation; the common provision of early vetches comes too late; and even the "never-failing" water-meadows have been backward, from lack of flood-water. Meanwhile, graziers have been obliged to buy in sheep and cattle as they had opportunity, looking for showers and the summer sun to clothe with herbage their bare and frost-nipped pastures; but May passing away, and June coming in, without bringing a supply of grass, the meadows could not be spared for "laying in" for

hay; and many farmers are beginning to calculate whether purchasing oilcake next winter, for consumption along with oat-straw, &c., will be dearer than the hay crop they must consent to go without. In some districts, too, in spite of the pains taken to make up for the backwardness of spring feed, in economizing straw, chaff, and corn, the live stock have been pining in field and foldyard; and in many cases no thatching-straw remains to secure the corn-ricks at harvest.

Undoubtedly, under such a state of things, farmers generally are resolving to grow a surplus rather than a deficiency of keep for next spring; and, by way of example, it may be well to relate how a clever agriculturist managed (in Suffolk, some years ago), in a similar predicament.

The winter of the year to which we refer was unusually severe; frost set-in in November, and lasted, with some variations of no great consequence, till the third week in January. A heavy snow fell at Christmas, and lay a month; but some partial thaws and successive frosts made everyone alarmed for the turnips, though no autumn for many years had been dryer (as in the past year); this being a favourable circumstance, as the mischief done by severe frosts is generally the effect of a preceding wet season. On light lands the crop had been much mildewed, and so rendered most liable to rot; the destruction was very general—some large farms in Norfolk and Suffolk losing nine-tenths of their roots, including all the early-sown. Flockmasters were in melancholy distress; lambs dropping when no provision could be made for the ewes, and hay, the general resource, being enormously expensive, besides giving little or no milk. Fatting bullocks and wethers had to be drafted off to Smithfield before half fed, and there sold in a bad market.

The spring was cold and backward, north-east and north-west winds prevailed, and what was more uncommon, southerly winds were cold and raw; and as the trifling rain that fell was with these cold winds, the grasses made little appearance before the last week in April. In the middle of May there was no herbage, natural or artificial (lucerne and chicory excepted), that would afford a full bite for sheep.

The farmer, whose practice we relate, never placed much dependence upon hay, but trusted mainly to root and green crops. Early in November, his cattle were tied up to straw, with a few turnips; but in the middle of December, the severity of the season rendering the turnips nearly useless, the whole stock of sheep and bullocks were put to cabbages. The flock got on very well upon this green food, which was carried to them upon a lea that required improvement; the beasts, however, throve but little. In wet weather, an allowance of hay or other dry meat was given to the sheep. The sheep were 24 days at cabbage, and the bullocks 20; and reckoning the keep at so much per head, the cabbage appeared in value between five and six pounds per acre, though the farmer could not have spared them for a much greater sum. His lambs began to fall the last week in February, and, cabbage being then done, and turnips giving little milk for them, the "couples" were drawn off, and put to another resource—namely, old rouen, or kept pasturage from the preceding year. This grass, feedable at any time when not covered by a deep snow, will hold, if wanted, to the last half of April, and the first half of May—periods always of want and difficulty, most other resources then failing. In the middle of January, the sheep and oxen were put to turnips, and (with the exception of the above couples) continued on them, the former till the middle of March, the latter till the third week of April; but the roots being then much decayed, a quarter of a peck of bean-meal mixed with chaff, was supplied to the beasts. The sheep finished the turnips in the middle of March, and then fell back upon a field of green borecole and kale, or *chou de vache*, of Flanders. This lasted until the 3rd of April; but the weather still continued without any appearance of spring. The old grass now took the sheep till the 18th, when they were turned into a piece of rye sown the preceding autumn. They were taken from this in little more than a week; and, as the pastures were still bare, great distress for food would have been felt if the farmer had not fortunately sown a considerable breadth of turnips on a wheat stubble, even before the shocks of corn had been carried. The turnip shoots were two feet high when both sheep and cattle were turned in; and the crop lasted till the 17th of May. The sheep and lambs had then another week's feed on the rye. The bullocks (that is, a few of the cattle that were tied up all along for fattening) had finished their turnips on the 21st of April; and thence up to May the 27th, when they were sold, consumed a bushel of potatoes (which it was then customary to give to cattle) and three-quarters of a peck of bean-meal each per day.

The conclusion seems to be, that a farmer with a large stock of cattle and sheep ought to provide a great variety of food that will serve in succession—that will last very long into the spring, and thus allow of artificial grasses getting a good head before being stocked. For this purpose he may have turnips or autumn-planted cabbages for part of November and December, then cabbages of any sort, followed by *chou de Flandre* or Algerine

kale. Afterwards comes in rye and then stubble turnips.

All this could be done before mangel wurzel was much cultivated. Now that this invaluable root has furnished us with a winter food that will keep as long as we like, and that Italian rye-grass and early varieties of rye provide us with young spring grasses, there is no reason why a provident farmer should be in distress for keeping even in such a delayed season as that just passed through.

HOEING—ITS PRINCIPLES AND PRACTICE.

No. I.

Hoeing is that minor operation in tillage of which ploughing may be considered the foundation, and which is to be followed up and be completed by the cultivator, the roller, and the harrow. The two great objects to be attained is the most perfect subdivision of the soil and the truest cleanliness. In the one case it can only, for the most part, be accomplished before the crop is sown; but in the other, it can be proceeded with while the crop is growing, and with the greatest prospective advantage to it.

Hoeing: its Principles.—The true principles of hoeing consist in the minute subdivision of the soil, the aëration of the soil, and the extirpation of weeds from the surface.

The minute subdivision of the soil.—Jethro Tull says, that "as soon as the ploughman has done his work of ploughing and harrowing, the soil begins to undo it, inclining towards and endeavouring to regain its natural specific gravity; the broken parts by little and little coalesce, unite, and lose some of their surfaces; many of their pores and interstices close up during the seeds' incubation and hatching in the ground; and, as the plants grow up, they require an increase of food proportionable to their increasing bulk; but, on the contrary, instead thereof, that internal superficies which is their artificial pasture gradually decreases. The earth is so unjust to plants, her own offspring, as to shut up her stores in proportion to their wants; that is, to give them less nourishment when they have need of more: therefore man, for whose use they are chiefly designed, ought to bring in his reasonable aid for their relief, and force open her magazines with the hoe, which will thence procure them at all times provisions in abundance and also free them from intruders—I mean, their spurious kindred, the weeds, that robbed them of their too scanty allowance." Thus wrote Tull 125 years ago; and those quaint and homely phrases contain the pith of the whole subject. Hoeing—deep continuous hoeing, judiciously applied—does surprisingly advance the growth of plants. It prevents the soil regaining its natural solidity. It keeps open the soil, and by breaking and subdividing it, causes it to present innumerable surfaces, interstices, or crevices, into which the young rootlets will penetrate, and extract their daily food as it is required; whereas if no new surfaces or interstices are presented, the plant has to force its own unaided way in search of this food, which much retards its progress by exhausting its powers upon a given spot too long. But if the soil is constantly stirred, subdivision goes on, and new particles of soil are brought into contact with the searching rootlets; besides this, the very tread of either man or horse will so shake and jar the earth around as to open many pores, into which the roots will find a way, long after the operation of hoeing is of necessity given up, and thus the crop is progressively and safely brought forward to maturity.

The aëration of the soil.—This is one of the most important principles involved in hoeing. It is an undoubted fact "that the roots increase their fibres every time the earth is stirred about them," and consequently the plants themselves grow the faster, providing, of course, fair judgment is exercised in directing the operation. This manifest advantage can only be rightly attributed to the supply of food thus communicated to the plants by promoting the admission of atmospheric influences into the soil, and by the minute disintegration of the soil, its subdivision and repeated stirrings making a new and plentiful "internal superficies" in it.

The theory of the food of plants.—The modes by which it is supplied from the soil, from the artificial aids now generally adopted, and from atmospheric influences, as also the appropriation of these various life-giving properties by the plants, is somewhat beyond the sphere of inquiry of a plain practical farmer; but if my readers would trouble themselves to read upon the subject they will find the simple fact as I have stated it. The great object, therefore, in hoeing, should be to provide a a deep, loose soil contiguous to the plant, for the reception of their food from the atmosphere, that the near and spreading rootlets may be induced to possess themselves of it; and the corresponding one should be with a view of providing a large extent of internal superficies or openings in and around which the plants can fix their rootlets and obtain food.

The extirpation of weeds from the surface.—

Cleanliness is indispensable to good cultivation; hence, one great principle in hoeing is the eradication of weeds. I shall reserve for my next paper, on the practice of hoeing, any notice of the ways and means by which it is accomplished. I only wish now to draw attention to the principles involved. Weeds will grow everywhere, and they will grow apace; they must be kept down, and, if possible, destroyed. Hoeing—repeated hoeing in all its variations—is the best method hitherto discovered for the destruction of weeds during the growth of the crop. In row culture it is an admirable adjunct to agriculture; and in broadcast sowing it may be advantageously adopted—the horse-hoe for deep culture, the hand-hoe for surface work.

There is something very encouraging in the consideration of these principles, the mere outlines of which I have but pointed out. If the surface of the earth or soil is left untilled, neither air nor moisture can be imbibed to any extent. The evening's dews are taken up by the morning's sun. Hoeing provides a suitable deposit in the upraised mould for whatever gaseous matter or moisture may descend upon it. In this way food is found both for the spongioles or rootlets, as well as the many mouths of the leaves or blades; this is, in fact, the act of feeding the plants. Another great consideration is that this very feeding creates greater necessity for food, it gives more mouths in the blades and leaves, more roots and fibres, all requiring daily supplies or sustenance. Now hoeing or stirring the soil is the great means of its replenishment, and the faster the plant grows the more and deeper hoeing it requires, and which it ought to receive so long as it can be given without injury being sustained by the operation itself. This continuous hoeing will, of course, insure the destruction of innumerable weeds, which would otherwise infest the soil, partially exhaust it, and damage the crop, besides leaving a large progeny for future condemnation. Hoeing, then, is the greatest means to promote the full and healthy development of the latent powers of the soil, by its continuous breaking up and subdivision of the gradually consolidating soil, by its rendering admissible every atmospheric fertilizing agency, and by the destruction of every obnoxious and intruding weed.

ON HAY-MAKING.

In early situations the hay harvest will soon be coming on for the artificial meadows, and some remarks on the general subject of hay-making will therefore not now be inopportune. We cannot, however, too often or too earnestly enforce the necessity of the farmer not being implicitly guided by routine practice, which is, perhaps, less to be followed in hay-making than in any other branch of farm management, on account of the changeable character of the weather, and the consequent necessity of adapting the course of proceeding to the peculiar circumstances of the case. In saving the crop of grass for consumption at another period of the season, when the fields do not yield supplies, the rule should be that the necessary drying should be affected with the least possible change in the composition of the material, and the change should, as far as possible, simply consist in the abstraction of moisture. But while this proposition will obtain a ready assent, it is surprising how little attention is paid to fully carrying it out. By undue exposure to the weather—especially during alternations of drought and rains—a large proportion of the hay made from the most valuable grasses is little else than a mere mass of woody fibre, almost completely divested of its nutritive properties. The soluble matters have been washed out of it, and it has lost that fragrant odour which is so characteristic of all well-made as well as of new hay.

Practice, to be successful, must be in accordance with *science*. In the process of hay-making, therefore, the farmer should make himself acquainted with the nature of the changes which take place, and how they may be modified; and this portion of the subject well understood, there will be little difficulty experienced in the business. Acting upon this conviction, we cannot do better than to place before our readers the article on hay-making, in "Morton's Cyclopædia of Agriculture," as the subject is there treated in a scientific as well as practical manner, the writer having, what is not very common, a correct appreciation of the manner in which information on agricultural topics should be conveyed to be of any value. The remarks which follow, refer more to the natural than to the artificial meadow; but the principles enunciated are of general application:—

Chemistry informs us that of the various ingredients which compose grass, those portions which are immediately soluble in water are the most fitted for purposes of nutrition; and, therefore, it should be cut at that period when the largest amount of gluten, sugar, and other matter soluble in water is contained in it. And that period is not, generally

speaking, when the plants have shot into seed; for the principal substance is then woody fibre, which is totally insoluble in water, and therefore unfitted for being assimilated in the stomach. It has been shown that "when the grass first springs above the surface of the earth, the chief constituent of its early blades is water, the amount of solid matter being comparatively trifling; as its growth advances, the deposition of a more indurated form of carbon gradually becomes more considerable, the sugar and soluble matter at first increasing, then gradually diminishing, to give way to the deposition of woody substance," the saccharine juices being in the greatest abundance when the grass is in full flower, but *before the seed is formed.* During all the latter part of the process of fructification, the formation of the seed, &c., the sugar rapidly decreases in quantity, and when the seeds have arrived at maturity, the stem and leaves begin to decay; so that, if the grass is not cut when in flower, a great amount of nutriment will be wasted. Many of the natural pasture grasses, however, are exceptions to this rule, some possessing a greater nutritive value when the seed is ripe, than at the time of flowering. In the cock's-foot grass (*Dactylis glomerata*), for instance, the proportional value at the time the seed is ripe to that at the time of flowering, is as 7 to 5; the value of the grass of the sweet-scented soft grass (*Holous odoratus*), when seeding, exceeds that at the time of flowering in the proportion of 21 to 17; and with the meadow cat's-tail, or Timothy grass (*Phleum pratense*), the culms are found to contain more nutritive matter when the seed is ripe, than those of any other species of grass that have been submitted to experiment—the value of the culms simply exceeds that of the grass when in flower in the proportion of 14 to 9. But though there is more nutriment contained in the seed crop of these grasses than in the flowering crop, nevertheless the loss of lattermath, which would have been produced in the time the seed was ripening, would more than outweigh the superior quantity of nutritive matter contained in the seed crop; and by aiming at the greater amount of nutriment contained in these grasses at seeding, a loss is sustained not only in the lattermath, but in the bulk of the hay itself; for although the crested dog's-tail grass (*Cynosurus cristatus*) yields just twice as much grass when the seed is ripe as at the time of flowering, the majority of the grasses possess a much greater quantity of produce when flowering than at any other time. The grass of the Welsh fescue is of equal value in nutriment at each stage of its growth; and the nerved meadow grass (*Poa nervata*) is equal, both in nutriment, quality, and quantity of produce, at flowering and seeding; but nearly all the other varieties combine the properties we have been describing, namely, of producing the greatest weight of grass, and also the largest amount of nutritive matter, when in flower. The meadow fescue (*Festuca pratensis*) is of more value when flowering than when the seed is ripe, proportionally as 3 to 1; the crested dog's-tail, although yielding much less grass at that time, contains nearly twice the quantity of nutritive matter when flowering as when the seed is ripe; and the tall, oat-like, soft grass (*Holcus avenaceus*), at the time of flowering, exceeds its value when the seed is ripe, in the proportion of 5 to 2. But without multiplying examples, it is obvious, from the foregoing remarks, that nearly every species of grass—no matter whether it contains most nutriment when flowering or when seeding—yields the most profit in hay and lattermath if it be cut when in flower. "It has, indeed, been proved that plants of nearly all sorts, if *cut when in full vigour*, and afterwards carefully dried, without any waste of their nutritive juices, contain nearly double the quantity of nutritive matter which they do when allowed to attain their full growth, and make some progress towards decay."

Now, the different kinds of grasses begin to flower at very different periods; and as it is evident that the best time to mow is when the greatest number of the most valuable grasses are simultaneously in flower, we may, perhaps, say that the herbage should be in that state of forwardness which indicates the full blossoming of all the earlier pasture grasses, and the ripeness of seed of the earliest; or, in other words, the seeds of the sweet-scented vernal grass (*Anthoxanthum odoratum*), sweet-scented soft grass, meadow fox-tail (*Alopecurus pratenses*), sheep's fescue (*Festuca ovina*), soft broom grass (*Bromus mollis*), etc., may be completely ripe; and the smooth-stalked meadow grass (*Poa pratensis*), hard and smooth fescues (*Festuca duriuscula* and *Festuca glabra*,) common quaking grass (*Briza media*), and crested dog's-tail, may all be in full blow. This will generally be about the middle of June. If the cutting of the crop be much protracted, the plants become withered at the bottom of their stems; thus the roots are injured, the future growth of the blades is weakened, and the eddish, or aftermath, materially lessened in quantity and deteriorated in quality, whilst the ripening of the seeds greatly exhausts the land. On the other hand, if cut too soon, there will be a loss in the quantity of hay; the lower or shorter portion, one inch in the height of which will weigh as much as two inches of the top, will not have sufficient time to grow to a profitable length, and a loss will be thereby incurred by the grass withering too much when being made. It is *much better to be too early than too late.*

The proper season for mowing the grass, so as to

secure the largest amount of nutrient properties within it, being thus determined, the next consideration is—the preservation of these useful qualities in the hay.

Experiments show that, out of the various constituents of which grass is composed, the mucilage, starch, gluten, and sugar, which are soluble in water, are alone retained in the body of an animal for the purpose of life, the bitter extractive and saline matters being considered as assisting or modifying the functions of digestion, rather than as being truly nutritive parts of the compound, and being voided with the woody fibre. The woody fibre serves only to give bulk to the food, and therefore distension to the stomach, which when moderately filled, brings those muscles into active exercise which tend so much to promote healthy digestion, by keeping the food in constant motion.

The principal object, then, which is to be aimed at in haymaking, is, to retain the soluble portion of the grass in perfect integrity.

This cannot be completely accomplished because of the imperfection in our present mode of haymaking, and the many casualties attending it. From various experiments made by Dr. Thomson, it has been found that 387½ parts (by weight) of grass form only 100 when made into hay. This amount of grass, under favourable circumstances, contains of matter soluble in hot water 28.13 parts, and in cold water 8.21 parts; but instead of this amount, the equivalent quantity of hay, or 100 parts, contains only 16 instead of 28 parts soluble in hot water, and 5.06 instead of 8¼ parts soluble in cold water. A very large proportion of the soluble or nutritive matter of the grass has obviously disappeared in its conversion into hay. The result of the process has therefore been to approximate the soft, juicy, and tender grass to woody fibre, by washing out or decomposing its sugar and other soluble constituents. "These facts enable us to explain the reason why cattle consume a larger amount of hay than is equivalent to the relative quantity of grass. Thus, animals which can subsist upon 100lbs. of grass, should be able to retain the same condition by the use of 25lbs. of hay, if the latter suffered no deterioration in drying; but experiments have shown that a cow, for instance, thriving on 100lbs. to 120lbs. of grass requires 25lbs. of hay and 9lbs. of barley or malt." * The great cause of this deterioration is the water which may be present, either from the incomplete removal of the natural amount of water in the grass by drying, or by the absorption of this fluid from the atmosphere. "Water, then, existing in hay from either of these sources, will induce fermentation, a process by which one of the most important constituents of the grass, namely, sugar, will be destroyed. The action necessary for the decomposition of the sugar, is induced by the presence of the albuminous matter of the grass; and the result is that the sugar is converted into alcohol and carbonic acid; and that alcohol is produced in a heated haystack, in many cases may be detected by the similarity of the odour disengaged to that perceptible in a brewery."

The process of hay-making, then, is the removal of this moisture from the grass; and Dr. Thomson has found that the only method which succeeds in preserving grass perfectly entire, is by means of artificial heat.

The quantity of water, or volatile matter, capable of being removed from hay at the temperature of boiling water, varies considerably; the amount of variation during his experiments being from twenty to fourteen per cent. If the lower per-centage could be attained at once by simply drying in the sun, the process of hay-making would probably admit of little improvement; but the best new-made hay that he has examined, contained more than this amount of water, the numbers obtained verging towards twenty per cent. When it contains as much as this, it is very liable to ferment, especially if it should happen to be moistened by any accidental approach of water. Rye-grass contains, at an early period of its growth, as much as eighty-one per cent. of water, the whole of which may be removed by subjecting the grass to a temperature considerably under that of boiling water; but even with a heat of 120 degs., the greater portion of the water is removed, and the grass still retains its green colour—a character which appears to add greatly to the relish with which cattle consume this kind of provender. The advantages attained by this method of making hay are sufficiently obvious. By this means all the constituents of the grass are retained in a state of integrity: the sugar, by the absence of the water, is protected from undergoing decomposition; the colouring matter of the grass is comparatively little affected, while the soluble salts are not exposed to the risk of being washed out by the rains, as in the common process of hay-making.

From the above chemical observations, made by Dr. Thomson, in his recent researches upon the food of animals, we learn the *theory* of hay-making; the inquiry now is—How, in practice, can we best approximate to the correct principles laid down?

It is an essential point that the mowers should be good workmen, and perform their work neatly and evenly, making the scythe cut as near the ground as possible, in order to ensure the greatest bulk of hay, and facilitate the springing up of the young shoots of the eddish or aftermath. They generally

* A particular experiment is here alluded to: 9lbs. of barley or malt is an extraordinary quantity to give to a cow.

begin to work before sunrise, and remain until after sunset; from one acre to an acre and a half, according to the bulk of the crop, being a fair day's work for a man. As soon as the dew is off, the mowmen should be followed by men and women with forks, who shake and spread the swaths evenly over the whole surface of the meadow; or this may be most economically and expeditiously done by means of a "tedding machine," drawn by a horse, which will do the work of twelve or fifteen hay-makers, and distribute the grass more thinly and evenly as it crosses the field.

And this must not be allowed to lie long beneath the scorching heat of the sun without being turned; for by thus doing, the upper part becomes brown and withered, whereas it is desirable to keep it as green as possible. All the grass which has been tedded and turned during the day, ought to be thrown together the same evening in "windrows," that is long rows throughout the field, gathered together by the hay-makers working in opposite directions, the two outside women, or boys, using rakes, the others forks, the hay gradually accumulating, whilst thus being sent on from one to another towards the place of the intended row, until it forms, from a party on each side, a double row, and two men follow, putting these two into one compact "windrow," about five feet wide and three high; or the hay may be put together into small heaps or "footcocks," the former method being preferable for expedition, and affording sufficient protection from heavy dews, the latter more secure from the injury of rain, and may be adopted if the weather prove cloudy or adverse. The following morning—or on the return of suitable weather—the whole must again be thrown out, so as to secure the greatest possible benefit from the sun's rays and drying winds; and the grass mown on the preceding night, and early that morning, may be tedded when the dew is off, and afterwards turned; and, provided it be fine drying weather, the first day's hay will now be sufficiently "made"—that is, it will have lost most of its moisture—the chief part of its natural juices will remain; and as it has been well scattered about and frequently turned, this will have been affected without some portions of the grass being too much withered, and others still too succulent. It still retains its fine light green colour, and the farmer's aim now is to secure it with the greatest possible haste. For this purpose, the hay is gathered together into rows, and the rows divided and collected into "hay-cocks," which may be done by forking; but if the sky is overcast and threatens rain, the windrows should be drawn up into large cocks by horses, two horses walking, one on each side the row, dragging a rope after them, which passes round the end of the row; two men ride upon this rope, and as the horses proceed, the hay rises up between them, forming a heap; and this, having slid far enough to accumulate a sufficient quantity, the rope is lifted up, the hinder portion of the mass pulled up on to the top, and another cock commenced. Care should be taken that the cocks are "made up" neatly and well, to keep out the rain, and the horse or hand-rakes must be kept going during the whole time. All the hay must, in due course, be made and cocked after the same manner. Unless the aspect of the sky betokens approaching showers, the smaller kind of haycocks, made by rolling up the windrows with forks into proper-sized heaps, will be best.

The next morning, or as soon as the weather permits, they may be well thrown out in "staddles" of a few yards in width, to insure the hay being sufficiently well dried, and it will then be ready for leading.

Of course the farmer must not be implicitly guided by any given rules for hay-making; in this operation he has to depend upon a very fickle and changeable power, namely, the influence of the weather, and he must vary and modify them to suit circumstances. The object to be aimed at can alone be exhibited to his view, and a model method pointed out for him to imitate as closely as he can. The description given of the chemical nature of this process explains to the hay-maker what he has to do, and, perhaps, the following truths will assist him in discovering the most eligible way of doing it.

First. He must remember that the chief point is to preserve the hay from dew and rain—water washes away the soluble salts and other matters, and when in the stack, will cause fermentation, and that injures the hay by destroying some of its most valuable properties; therefore bring it into windrows, or make it into footcocks at nightfall, and never open it in the morning until the dew has evaporated.

Second. Bear in mind that if the weather is unfavourable, the less it is disturbed the better, and the longer will it retain its native powers. Hay has been found to preserve a great amount of its nutritive qualities for many days—nay, even weeks, when mown wet, or when saturated with the rains whilst lying in the swath; if, therefore, the weather be unfavourable, it will be better not to tedd the hay at all, nor even turn over the swath. If repeatedly dried and wetted again, it soon becomes valueless; this error of meddling with hay amidst frequent showers must, if possible, be avoided, for it is far better to have it somewhat tainted in the haycock than thus exhausted of its nutriment, and spoilt by repeatedly being spread.

Third. Take care not to allow it to remain long under the hot beams of the sun without being turned—this will preserve the colour and fragrance of the grass; so that, without baking it too much (thus destroying its virtues), it may be so dry that as little

heating or fermentation as possible shall occur in the stack, remembering also that coarse grass does not require so much "making" as fine succulent herbage.

In leading to the stack, all the force of the farm must be brought into requisition if necessary; as much depends upon the speedy and proper securing of the hay. The shape of the rick is not a very important consideration, but an oblong form is perhaps the best; small in size, if the farmer has been unable properly to make his hay; but if it be in good order, the larger the better, as less surface, in proportion to the quantity, will thus be exposed to the atmosphere, to imbibe moisture, or have its goodness washed and dried out. Stacks, both of meadow-hay and the artificial grasses, are sometimes ventilated by means of funnels up the interior, either consisting of rough wooden framework, or made by keeping open a hole with a skep, or similar appliance, drawing it up, and treading the hay round it as the stacking proceeds, for the purpose of preventing the hay from becoming mow-burnt, by thus letting off the superabundance of hot vapour. This may be regarded as an advantageous practice; although the hay around the chimney generally becomes mouldy, unless the funnels be covered up before all the heat has passed off. A desirable, and probably much better and safer plan, when the hay harvest has been accompanied by wet weather, is to place a few layers of straw in the stack at intervals. This will absorb the moisture from the heating hay, and prevent the risk of fire. In clover and sainfoin stacks, mixed layers of straw are particularly useful (especially when the hay has been stacked very green), as the straw not only absorbs the superabundant moisture occasioned by the peculiar succulence of the herbage, but becomes itself almost as good as the hay; and the whole together cuts up into most admirable fodder.

Every grower should possess a rick-cloth; either that kind supported by poles and ropes over the stack during the time it is being built, or a common cloth sufficiently large to throw over the stack, to protect it from wet. They prove also exceedingly useful, both in the corn and hay harvests, in covering down stacks.

The sides of the stack should lean well outwards, so as to miss the drip from the eves; and after its subsidence or *settling*, it should be well trimmed—that is, the bents, &c.—pulled out by hand, and the corners neatly tucked in, the trimmings being employed to top up the stack. It is then securely thatched; and care ought to be taken that in all future cuttings for fodder, the interior should not be unduly or needlessly exposed.—The Irish Economist.

STEAM CULTURE.

No. I.

FIXED ENGINES AND SHAFTING.

The agricultural mind has at length, it appears, become reconciled to steam as a motive power for the cultivation of land. The time was when the proposition of ploughing with horses was even looked upon as an "agricultural impossibility;" but when our simple forefathers discovered that the flowing tails of their teams were natural appendages for the purpose of draught, their eyes were opened to the march of progress, and the discoverer was hailed as the benefactor of his race. Since then many a step has been made in advance, and doubtless we are yet far from the end of the chapter. Throughout the length and breadth of Asia things remain as they were in the earliest ages of antiquity, scarcely any progress having been made; indeed, on the contrary, for several generations past they have been moving in a retrograde direction. Whether those political revolutions now threatening this great division of the world, the cradle of the human race, will prove the forerunner to mechanical progress; and whether Turkey, China, and the intermediate kingdoms are about to become dependent upon us for agricultural implements and machinery, are questions yet in the womb of futurity. At the same time experience, so far as gone, obviously bids us hope for the best; for there cannot be a doubt that the war in which we are now engaged on behalf of the first of these kingdoms will have the effect of introducing new ideas into the minds of her Christian subjects, if not Mussulmen themselves. The progress of railway communication in our own East Indian territory, again, and the civil commotions in China, are both pointing in the same direction. The most superficial observer of passing events, and the influence they are exercising, cannot be blind to these things. But whatever results may be experienced among Moslems, Brahmins, and Celestials, one thing is manifest, in England—that Englishmen must "go a-head"; and the May meeting of the Central Farmers' Club proves that her farmers, whatever may have hitherto been their position, are not to lag behind in the march of progress, but, on the contrary, henceforth occupy, as they ought to do, the van.

At present, several plans are proposed as to the application of steam as a motive power, and as many relative to the culture of the soil. Some, for example, on the first head, propose a fixed engine, shafting, or pulleys; others a portable engine or two, fixed at one

or both ends of the field or ridge; a third class of inventors propose the engine to travel along the ridge by means of chains or other contrivances, while a fourt advocate combinations of these with or without horse power. In the cultivation of the soil, again, we have the several plans of digging, rasping, and ploughing. Being always anxious not only to extend freedom of action towards inventors, but to give them encouragement, we—instead of pronouncing what might justly be termed a premature judgment as to which plan is best—propose confining our observations for a little to the respective merits of each, allowing facts as much as possible to speak for themselves.

And before even entering upon such propositions, it may be as well briefly to glance at the grand object to be accomplished — viz., to supplant horses by a more economical power, cultivating the soil and husbanding its produce more advantageously without them; to elevate ploughmen to a higher rank in society; and to increase the supply of home-grown food for our manufacturing and commercial interests. If a farmer has to invest some £500 extra in steam-engines and machinery, for instance, and is at the same time obliged to keep up his present strength of men and horses, how is he and the public to be benefited by this additional expenditure? The practical man must not overlook the fact that the number of horses required in seed-time are generally needed for carrying in harvest; so that if he invents or adopts machinery to perform the work of the one season, and not that of the other, he falls short of the grand object in view; in other words, his project is not a practical one. Any machine capable of superseding or doing the work of the horse must, of course, perform the whole; and when we look at the labours of this faithful servant, the many toilsome jobs that fall to his lot, it will readily be perceived that success involves a new system of things—a complete revolution in the routine of British agriculture.

There will be no difficulty, however, experienced here by the pioneering genius of invention, so long as it is an easy matter sending old systems up the chimney and bringing successful new ones in at the door. Probably little short of half the number of ploughs in the kingdom, for example, are only fit for firewood; while horses, however faithful drudges they may be, are very expensive machinery to the farmer, much more so than is generally imagined, so that few regrets will be expressed in parting with both, the moment something better is found.

No doubt in the field an intermediate proposal may be made. Railways, for instance, may be introduced to facilitate the operations of carting. With such an auxiliary a couple of good horses would soon carry out lots of manure, and home plentiful harvests; and with them a farmer could do many of the odd jobs difficult to be brought within the power of steam, more especially in unfavourable situations. Intermediate proposals of this kind, however, must always be looked upon as exceptionary in theory, and not the rule by which inventors are to be guided; for horses on a railway are more objectionable than horses in the plough. The sum and substance of the whole matter briefly amount to this—that the odd jobs and labours of the farm as now performed by horses must be so organized as to fall within the power of steam.

Bearing these premises in mind, let us now turn to the first proposition—*fixed engines*—one which of course includes water and wind, as well as steam, for the motive power.

With a fixed steam-engine in the centre of a farm of 640 acres, the length of shafting would not exceed a mile, being only a half of that of some of our large manufactories. Such being fact, the details of an agricultural manufactory become worthy of a more minute illustration. For this purpose, if we suppose a farm of the above size to be a square area, then on a four-course shift of cropping we would have four square fields of 160 acres each, minus the space occupied by the farmery, each field being one-half of a mile long, and of an equal breadth. Now if we further suppose the farm intersected by a railway with longitudinal sleepers, braced at every length of 12 feet, these braces or transverse beams supporting shafting, then we would have a mile of railway, and the same length of shafting right across the farm from the one side to the other, passing the homestead at the centre.

This railway, shafting, engine, and farmery would be fixed stock, or "plant." The railway might communicate with some public railway, so as to admit of the removal of produce and the bringing of artificial manures and the like to the farm. On larger concerns, or where the communication from another farm to a public railway passed through it, two lines of rails might be necessary in order to allow rolling stock or waggons to pass each other without sidings, which latter would be at variance with the theory of a fixed engine in the centre of the farm. When such was the case the shafting might be more conveniently placed between the two lines of rails.

This shafting would communicate motion to the utmost extreme of either side of the farm. At one time only one-half its length, or that on one side of the farmery would be set in motion, and this half might be removed to the other side, so that one mile of shafting would both serve; but *time* is of so much importance to the farmer in seedtime and harvest, while the shifting would be so frequent, that shafting on both sides would be preferable. It is only, however, in cultivating the farthest side of the field that the whole length of shafting would be set in motion; for as we neared the homestead the length could be shortened by means of coupling-boxes, so that contiguous to the engine only one length, or 12 feet (supposing such to be the lengths into which they are made) would be used.

Let us next suppose a travelling crane placed upon this railway, having gearing for communicating motion laterally along the length of the field, and for receiving that motion from the lying shaft, and so constructed as to remain firm on the railway, resisting the lateral strain of cultivation. It may be 12 feet long, the length of the divisions of the shafting; so that this length across the field would be cultivated from end to end at every shifting across the braces of the railway sleepers or bearings of the shafting, as subsequently noticed. A small

pinion or driving-wheel would be placed on every lying shaft for communicating motion to a shaft on the crane running along its whole length. On this shaft the gearing for communicating lateral motion already referred to would slide from end to end as the field was being cultivated. This could be done by the engineer or man in charge of the crane with a crank, or the lying shaft could be made to work the gearing along the shaft of the crane at any given speed circumstances demanded.

The cultivation of the field by means of shafting is a more problematical affair, yet easily done. Let us suppose, for instance, a jointed shaft to extend from the crane on the railway to the opposite end of the field, which would thus be one-half of a mile, or 880 yards in length. Next, let this shaft be armed from end to end with talpaian claws, rasps, or digging prongs, like Samuelson's digger, and so designed and constructed at the farthest end that a man might control it by means of a lever, or any other mechanical power which the judgment of the engineer may recommend, keeping it always directly opposite the crane. Now were motion communicated to such a shaft, thus armed from end to end with mole-claw apparatus, it is manifest that, however stubborn the soil might be, something would be done; and with rasps on the periphery of small wheels, something resembling Crosskill's clod-crusher, the result would be still more certain, though the speed across the field might be less; while, were 240 revolutions per minute given to a Samuelson's digger one-half of a mile in length, hares, rabbits, and amateurs on horseback would have to take to their heels to keep out of harm's way.

If a team of six horses is required to work a three-feet Samuelson's digger, then 5,280 horses, or an equivalent power of steam, would be required to work the whole length of the field! Such a strength, however, is unnecessary; for, by commencing at the farthest end with a four-wheeled machine having within its framing clawing, rasping, or digging apparatus, or three or four ploughs, scarifiers, &c., like Mr. Williams's patent machine, exhibited at the Smithfield Club show, motion might be communicated to it, working it across the field from the one side to the other, shortening the lying shaft as the work neared the crane. Three men—one at the engine, another at the crane, and the third at the cultivating machine, would soon go over 160 acres: for supposing it to cover 6 feet at a time, and to go at the rate of half a mile per hour, then in twelve hours it would do a ridge of 24 yards across the field, and in six weeks the whole field—being at the rate of upwards of 4 acres per day; and, at the rate of one mile per hour, nearly 8⅓ acres per day; or the length of working time could be such as to give a result of 10 acres per day.

It would doubtless require heavy shafting and an immense steam power to obtain the above speed and results; so that the expense, we fear, would be a practical barrier in the way. There is even, however, a greater barrier than this, viz., the carrying of manure and produce of harvest. Every farmer who has farmed 640 arable acres in the fickle climate of Britain, must be aware that short of twelve horses in harvest would often leave him in a queer predicament; and if he has to keep this strength for hay and corn harvest, the expense of steam as a motive power with shafting will appear still more objectionable. Again, once admit chains, ropes, pulleys, &c., the question arises to what extent should these be adopted; which brings us to the next head of our subject—the *fixed steam-engine and pulley*.

THE ACTION OF COMMON SALT WHEN MIXED WITH GUANO.

Some experiments lately reported upon the action of common salt when mixed with guano are instructive, as well as suggestive of further examinations. It is well known that guano, when used as a top-dressing, is best applied in rainy weather, and that its ammonia is rapidly dissipated by exposure to the sun and winds. Again in top-dressing cereals with either cubic petre or guano, it has been found advantageous to mix the guano with a certain proportion of common salt, the salt being found to preserve that hardness of the straw which guano has a considerable tendency to weaken.

To ascertain the extent to which the exposure of guano in a dry atmosphere diminishes the amount of its ammonia, and the effect produced in *fixing* that ammonia by an addition to it of half its weight of common salt, was the object of M. Barral, the editor of the *Journal d'Agriculture Pratique*, in some experiments which are reported in the last number of the *Edinburgh Quarterly Journal of Agriculture*. We need only describe in his own words one trial, where he observes:—

"We left in the open air, in plates, during fifteen days, equal weights of the pure guano, and the guano previously mixed with salt. At the end of that time we examined anew the amount of nitrogen, and found that the pure guano had lost 11.6 per cent. of its nitrogen, while that mixed with salt had lost only 5 per cent."

These experiments furnish us with more than one valuable suggestion; they not only show the importance of using common salt in conjunction with ammoniacal manures, but they clearly prove the importance of protecting these from the action of the atmosphere. It should never be forgotten, in fact, by any of us, that when we *smell* very strongly any manure, there copious emanations are going on, deteriorating the value of the ferti-

lizer; a loss that, either by the use of some chemical fixer or of nature's own unfailing fixer, the soil, might have been very commonly prevented.

The quality of the common salt used is of some importance; the kind which we have always preferred is the oil-stained fishery salt, chiefly obtained from the Cornish pilchard fisheries. The fishermen of that magnificent coast pile up in their storerooms these fish in large banks—first a layer of salt, then a layer of pilchards, then salt, then fish, till a heap is formed several feet high. As these are a very oily fish, the oil soon begins to drain from them through the salt, and reaching the paved floor on which the pile is resting, is conducted by channels formed in the pavement into little cisterns. This oil (which is very valuable for certain manufacturing purposes) turns the salt of a yellow colour; and its mixture, added to a proportion of other fishy matter, rather adds to the value of the salt as a manure. Considerable misapprehension is generally diffused as to the varying chemical composition of the ordinary salt of commerce, an opinion which perhaps had formerly more foundation than now. When the enormous duty existed with which common salt was during nearly the first quarter of the present century burdened (15s. per bushel), the necessary regulations of the excise so hampered the manufacturer that it resulted in the production of a great variety of much too rapidly produced, and consequently inferior, salt—descriptions not nearly so good as the salt slowly produced in dry warm climates, by the action of the sun and wind upon sea water, exposed to their action in shallow ponds, or by the nearly equally gentle evaporation of some of the Cheshire salt refiners. Since, however, the removal of the excise officers from these great works, the manufacture of salt has generally improved; and in some late chemical examinations of Professor Anderson, he found a very slight difference in the composition (so far as the earthy matters are concerned) between I., the salt of Cheshire, refined at Bath for Dairy purposes; II., the Cheshire stoved salt; III., the Cheshire marine or butter salt; and IV., the Preston Pans (by sea-water made) dairy salt—useful analyses whose results (per cent.) we subjoin from the pages of the valuable contemporary we have last quoted.

	I.	II.	III.	IV.
Common salt, or chloride of sodium	98.71	99.12	96.12	94.85
Lime	0.39	0.39	0.81	0.35
Sulphuric acid	0.56	0.48	1.01	0.73
Magnesia	—	—	—	0.35
Water	0.34	0.02	2.06	3.72

The examinations of Dr. Anderson were made with reference to the description of salt best adapted for dairy purposes, and his paper may be read with advantage as one of the same series as those of Prof. Way on butter, to which we recently referred.

He says—"We think truly enough that, as far as the use of the best salt for the dairy is concerned, it seems obvious that we must mainly depend on its purity. As to the four samples, it would probably be of little moment which was employed, as in all the quantity of impurity is so small that it may be altogether neglected in practice."

We are not sure, however, whether in practice the latter portion of the Professor's observations is correct, when he concludes that "the form of the salt is not immaterial, and that when in fine powder it is clearly preferable to large grains or crystals, and that because it admits of more thorough incorporation with the butter its antiseptic effects will be secured by the use of a smaller quantity than would be necessary if in larger crystals." Do the observations of our readers in the dairy localities lead them to such conclusion? On this head, can any of our readers favour us with the result of any *comparative* trials?

SACKS.

Sir,—I have observed notices from time to time in your Journal complaining of the heavy loss of sacks sustained by millers and others, especially those engaged in the London trade, and of the difficulty they meet with in obtaining redress upon discovering the depredators. This outcry about sacks is of very ancient date; for it is a fact well known to philologists that with slight variations the word "sack" occurs, with the same signification, in almost all languages, ancient and modern; and the learned, by induction, trace it back as far as the building of the Tower of Babel, at which there was such a hubbub amongst the workmen every night for sacks to put their tools in, that the word was never forgotten. Be this as it may, having myself formerly had considerable experience in this sack question, my sympathy with the parties aggrieved has been excited, and I therefore propose in this letter to give you a little of my experience on the subject, for the benefit of "all whom it may concern."

In the year 1823, I happened to be agent for several country millers, all of whom made bitter complaints to me about their losses in sacks. One of them, who had been in the business three and-a-half years, and whose consignments of flour were 500 sacks per week, handed me an account of his purchases of new sacks during that period, to supply losses. They amounted to 16,500,

which, at 2s. 6d. each (for sacks were *sacks* then), cost him £2,062 10s., or nearly £600 per annum. He accompanied the account with the remark, that "something must be done" to put a stop to this shameful system of plunder, which would ruin any trade. After reflecting on the business a little, I wrote him word, that if the firms would back me vigorously, I would rectify the evil; but there must be no hesitation or half measures. This was promised, and I immediately set to work. In the first place, I fixed an establishment for collecting the sacks of those firms for which I did business. I next gave notice (repeated thrice) to the public sack collectors, not to take from the bakers those marks, on pain of prosecution. My third step was to find an honest and respectable lawyer (save the mark!) on whom I impressed the necessity of prompt measures in all cases I might submit to his management; for I foresaw that the most strenuous opposition would be offered by the sack collectors to my arrangements, which they considered an attack upon their "vested rights." How these "vested rights" were exercised, I shall have occasion presently to show.

As I foresaw, my thrice-repeated notices were scouted by the collectors; and I soon had plenty of business on my hands. The first person whom I had occasion to prosecute was at the head of the craft, and had a wharf besides. He continued to take my sacks as usual; so, after three cautions, I had him served *with a writ of trover* in the Court of King's Bench. In a towering wrath, he went to his lawyer, the late Mr. Mills, of Hatton Garden, to instruct him to defend the action. This latter asked him whether he took the sacks? and, upon his replying in the affirmative, "Well," said, Mr. M., "then send them back instantly, pay the expenses incurred, and give an undertaking that you will not meddle with their sacks in future. I know something of the party, and that they will spare no expense in a prosecution; so that, instead of five pounds, you will, by defending the action, have to pay upwards of a hundred, and lose your cause into the bargain."

He sent home the sacks, and "did as he was bid." I never had any further trouble with him, except a volley of abuse, repeated occasionally for twenty years after; for he never forgave me the having to pay the expenses.

My next rencontre was with a man in the Old Kent-road, who persisted in taking my sacks, with a "perseverance worthy of a better cause." I had to serve him with notices of action three different times, and even this did not cure him; for he was implicated in the transactions of a marine store-keeper, who was detected in sending off 37 cwt. of sacks, new and old, cut up into "old junk," for the paper mills! a very common affair in those days, whatever it may be now. My friend the collector was involved in this, as having supplied at least a part of the sacks; and I am sorry to add that in his case the affair ended tragically: hearing that a warrant was out against him, he became dreadfully alarmed, fell ill, took to his bed, and died within a week.

It would take up too much space to relate all the escapades of these honest people. I was compelled to prosecute them all round (with the exception of two), over and over again. One I detected in selling my sacks at half-price; and on taking him before a magistrate, he consented to abandon the trade and go to sea, if I would not prosecute. The magistrate advised this course, and it was accordingly acted upon. The result of all was, that in six months the collectors would *swear* over my sacks, but not touch them; and in the five years during which I sold for the firm referred to above, and who had purchased so large a quantity of sacks previously, they had no occasion to buy a single one. I kept a regular account of sacks against the baker, so that if anything went wrong I could detect it at once; but so correct was the return, when the bakers came to understand my motives and system, that I had no trouble with them.

It may be supposed that my novel movements attracted the curiosity of the millers and factors; which, in fact, I was desirous of, in order to make it generally useful. I collected information on the subject of the losses sustained annually, by which I ascertained that they were a least 5 per cent. upon all the sacks of flour then sold in London; namely, one-twentieth of 1,300,000, or 650,000 sacks, which, at 2s. 6d. per sack, amounted to £81,250 per annum. In the mean while, my consignees laid my estimates and proceedings before the millers in their own neighbourhood; and at a meeting in a provincial city, a paper was drawn up and signed by eighteen millers of the first respectability, shipping to the London market, agreeing to support me in what I had undertaken, which was, to form a Sack Association, embracing the whole trade, for the protection of sacks from plunder and spoliation of every kind. This association was established, and existed for three years; but the opposition of the large town millers, who would not join it, for motives best known to themselves, caused it to fall to the ground. The immediate cause, however, of its failure was as follows:—The wharfinger with whom I landed my consignments of flour noticed to me one day that he had seen a barge-load of my sacks (filled) go up the river, and asked if I had sold any on board. I told him no, but possibly my principals might have done so. I then wrote to them about it; and, finding that they knew nothing of it, I set about inquiring into the affair. By mere accident, I learned that the sacks had been landed at Irongate Wharf, and were then lying there in the name of a baker in the Minories. After satisfying myself of the truth of the information, I waited on the party, and requested to know in what way the sacks came into his possession. Not being able to get any satisfactory reply from him, I wrote again to my principals, stating the whole case, and immediately received orders to commence a prosecution against the party. In the meanwhile, the latter, alarmed at the affair being discovered, applied to the miller with whom he did business, to endeavour to prevent a prosecution. This person—who was a Norfolk miller, and the largest seller on the London market, and one of the most strenuous supporters (being chairman) of the Sack Association—so interested himself with my principals as

to induce them to forego this prosecution. But so disgusted were they (and those of their friends who had hitherto supported the association) with the whole transaction, that they withdrew from it, and the concern fell to the ground.

With regard to the various ways in which sacks come to an "untimely end," or get astray from their real owners, they are as numerous as the uses to which a sack can be applied. They are, in fact, looked upon as *unprotected property* by the low public, and, I much fear, by some in a higher station in life. I have seen in your Journal a list of modes in which they are applied, perfectly correct, but not complete; to it might be added the frauds which millers commit in this way upon each other. Many small millers *never purchase a sack*, further than feeing the journeyman baker to let them take those which do not belong to them. I have gone into mills in which the sacks presented as motley an appearance as a regiment of raw recruits before receiving their uniform. But the marine-store dealer and the bung-cloth manufacturer are the great consumers of stolen millers' sacks; at least, when I had to do with the trade, there was one of the latter who entirely supplied himself with material in that way. I have reason to believe that from fifty to seventy tons of sacks were annually sent to paper-mills by the London marine-store keepers. The bakers' men, too, have an awkward habit of putting a sack into the oven occasionally, to brighten up the fire or make a blaze. I have known one throw *eleven sacks* into the oven at once; but that was a case of spite, because the miller gave him only 5s. instead of 10s. 6d. as a Christmas-box! I ought to add that his master, on being told of it, turned him away; he should have prosecuted him at once.

But what remedy can be applied to this crying evil? I reply, *none;* unless the millers and factors can *agree* and *unite* to put a stop to it. At the time I refer to, I had drawn up a plan for a *general sack depôt*, to which all sacks should be taken. I proposed that it should be under the control of a committee of millers, with a staff of officials sworn to secrecy, as to the business of the members of it. I have not the particulars of this plan by me now, and cannot at the moment give them. But I was, and still am, of opinion, that until millers have some plan of the kind, they, and more especially the country ones, will be continually liable to losses which will make their trade in London a poor one. I have mentioned above, that eighteen millers signed an agreement to support me in my plans. *In ten years thirteen of those had failed;* and I have reason to believe, that the chief cause of their failures was the losses in sacks!

With regard to the magistracy, I cannot say that my experience confirms the representation Mr. Hollick has given in a letter some time back in your paper, of those to whom he applied. In London they know better than to treat so serious a case with levity, *because*, the property stolen is so exposed to depredation as to be "*almost* public property." For that very reason, it ought to be the more strictly guarded; and I have no hesitation in saying, that in the case in question, the magistrates and their clerk displayed a dereliction of duty disgraceful to them as public officers, and most injurious to the public safety. In every case in which I had to appear as prosecutor—and I believe it was the same with others—the magistrates showed the utmost readiness to do justice, by protecting our interests and punishing the parties who were brought before them, when their guilt was proved. A single sack, it is true, is a small matter; but the aggregate of loss in sacks, in London particularly, is immense; and such conduct as that of the clerk and the bench of Nuneaton magistrates, would, if general, consign the whole property in sacks to the tender mercies of whatever plunderers chose to appropriate them to their own use.

Yours faithfully,

An Old Flour Factor.

London, June 19, 1855.

STEAMED STRAW CHAFF AS FOOD FOR STOCK.

Sir,—In reply to the remarks of "A Subscriber" in your number dated May 21st, I would beg leave to say that if he has failed to produce the effect upon his cut straw which I recommended, it must be that he cannot have properly followed my directions: the thing is so easy, if properly done, that it cannot fail. What effect he wishes to produce I do not know; but all that I ever proposed or wished to effect was so to soften down the hard and flinty nature of the straw, either by steaming, moistening with hot water, or by spontaneous fermentation, as to render it palatable and digestible as food for stock. That my method effectually accomplishes this, I will give you an illustration. A friend of mine who farms largely a few miles beyond me, who knows I am not remarkable for luxurious feeding of horses (by-the-bye I hate to see a fat horse; it always brings to my mind one of three things—either he is overfed or underworked, or his master has got more money than wit), seeing my team pass his farm one day, remarked to my horsekeeper, who was driving, that his cattle did him great credit, and asked how his master was keeping them to have them look so well. "He's keeping them upon straw, Sir." "Nonsense, man!" said my friend; "you don't mean to say that they are looking thus well upon straw!" Not that my man meant to intimate that they were kept exclusively upon straw, but that with their ordinary amount of work, and usual allowance of corn, their improved condition was owing to the bulk of their food being steamed straw, instead of dry hay and straw-chaff as formerly. However, a little while after my friend thought he would just give me a look, and see into this straw question. Accordingly one day, when I was in the midst of my straw cooking, he called to see me. Upon meeting me he said, sniffing the air, "Brewing, I suppose?" "Yes," I said; "brewing without malt." "It smells well, however," said he. Presently I took him to see my cooking concern in operation, when, taking up a handful of the steamed chaff, he exclaimed, "I don't wonder now at your horses looking so well; why it seems good enough to fat a bullock."

The fact is, that the aroma which the straw gives off in cooking, and the unctuous feel of it in the hand when cooked, would lead any one to suppose that it had higher feeding qualities than it really has. I only introduce this little anecdote just by way of showing that steaming is quite sufficient for bringing out the valuable feeding qualities of the straw, without any further fermentation.

I will now, however, recapitulate the necessary points to be attended to in steaming straw-chaff. First, let your receptacles or vats for steaming in be as large as you can fairly have them. Mine are 6 feet square, inside measure, by 3 feet 6 inches deep, and are made of brickwork, both for economy and convenience. Let there be a perforated false bottom (perforated iron plates are the best), having a space of 3 inches between that and the true bottom. The steam is admitted between the true and false bottom by a pipe which leads nearly across the vats, and is perforated on its sides along its whole length. On the opposite side of the vat, between the true and false bottom, is a wooden plug to let out superfluous moisture.

In putting the cut straw into the vats for steaming, only put in at once a layer of about three inches in thickness; *moisten this thoroughly* (I prefer hot water for this purpose, and make use of the condensed water from my steam engine; but when I have not enough for this end I prepare hot water on purpose), then add another similar layer; moisten that likewise, adding a little sprinkling of salt to each layer, and so on until the vat is filled. Cover up close, turn the steam on, and in from one to two hours' time, according as the chaff is sprinkled with hot water or cold, the chaff will be sufficiently cooked; but if you find that then it is not sufficiently tender, let it remain on until it is. When I remove the cooked chaff from the vats, I add the minced roots to it (it is not necessary, nor do I think desirable, to steam the roots) in that proportion, according to the quantity in hand, and the nature of the stock to be fed. If fatting stock, more roots, and less straw; if lean stock, *vice versa*. I am yet feeding nearly a hundred scores of ewes and lambs, and twenty scores of grazing sheep daily, with two-thirds steamed straw chaff, and one-third hay chaff, with a portion of minced mangold wurzel, and a very small portion of linseed cake reduced to powder, and dusted over it. And here note, that as the season advances more into spring, it becomes necessary to make your food better for your stock; but in winter time, I feed exclusively, or nearly so, with straw.

And now a word upon fermented straw. If "A Subscriber" will refer to my letters in your journal, he will find that I state it is necessary, in order to bring on spontaneous fermentation in straw, to add one-third of minced roots to two-thirds of straw chaff, *this well moistened* with hot water (or even cold will do, only it takes longer to accomplish) with just a little sprinkling of salt, mixed well up together, and thrown into a heap, will be ready for use, at this season, in about two days. The brick vats are excellent for throwing the mass into, for fermenting. I will only add that I intend to exhibit at the Carlisle meeting a working model of my straw-steaming apparatus, as also of my Royal Agricultural Society's prize pulping-machine, at the stand of that eminent machine maker, Mr. James Woods, of Stowmarket, Suffolk.

FREDERICK PHILLIPS.

The Hall Farm, near Brandon.

P.S. I would just say that though I use steaming, in preference to spontaneous fermentation, as being more convenient where there is steam power in use, yet when I saw the letter of "A Subscriber" in your paper, I immediately (22d inst.) set a quantity of *straw chaff* to work (about a hundred bushels) with one-third *minced* roots, (the ordinary cut roots will not do nearly so well as minced roots); and to-day (23d inst.) when I write, it is thoroughly fermented, and fit for immediate use, prepared as before directed.

THE DIFFICULTY OF JUDGING BETWEEN FIRST-RATE ANIMALS.

SIR,—Allow me to offer a few remarks on this subject, as applicable to the approaching meetings of our leading agricultural societies, now close at hand.

The difficulties which are often experienced by the most competent judges, in deciding between two really first-rate animals of a first-rate sort, are greater than the majority of people who have never acted in the capacity of judge have any idea of. I am happy to say that at the meetings of the Royal Society, such cases frequently do occur, and, I hope, always will, and with the wish that what I here suggest may tend to assist judges on their laborious duties, I am induced to trouble you with these remarks.

I will take an instance of two first-rate short-horn bulls, neither of them having a faulty point. Judge A. says, "What a superb back No. 1 has!" B. says, "But look at that depth of carcase in No. 2." "But the length of quarter in No. 1!" continues A.; and in return B. draws attention to the silky texture of the skin of No. 2. The question is here put to Judge C., who *should* decide the case; but he has to balance, in *his* mind, whether a superior back is more to be considered than an extraordinary depth of carcase; and again, is a first-rate quality of hide equivalent to an unusual length of quarter? And thus points, without having some definite value attached to them, might be compared one against another *ad infinitum*, without ever coming to a satisfactory conclusion.

Now, what I wish to see is, a definite value affixed to every point in the perfect animal, and when such cases of nicety as I allude to do occur, let the judges take point by point, and compare value in numbers, and then the animal commanding the highest amount would be the one selected. If the perfect animal were 50, the component parts might be something as follows:—

	Bull.	Sheep.	Boar.
General appearance	8	12	10
Back (length and width)	8	10	8
Chest	6	4	5
Width of hips and loin	5	4	5
Depth (rotundity of carcase)	5	5	4
Quarters	5	3	3
Head	4	4	9
Hide (or wool)	4	5	2
Bone	3	2	2
Shortness of legs	2	1	2
	50	50	50

This table is merely on a rough scale; but, I think, if the committee of the Royal Society would devote one of their meetings to the consideration of the subject, their time would not be wasted; and a scale made under their direction, similar to the above, would be received by the agricultural public as an authentic data to refer to.

Hoping that these remarks may draw the attention of our great stock-breeders to the subject,

I remain yours, &c.,

X. X.

CLASSIFICATION AND EXTIRPATION OF WEEDS.

BY J. D.

(Concluded.)

26. LOUSEWORT,

Or the "Pedicularis" of botany, is a very frequent weed on moist pastures and meadows. The plant is very beautiful, and belongs to the class and order "Didynamia Angiospermia" of Linnæus, and the natural order "Pediculares" of Jussieu.

Generic character: Calyx—perianth one-leaved, roundish, ventricose, with a five-cleft equal mouth, permanent. Corolla—one-petalled, ringent; tube oblong, gibbous; upper lip galeate, erect, compressed, emarginate, narrower; lower, spreading, flat, half three cleft, blunt; middle segment narrower. Stamina—filaments four, the length of the upper lip, under which they lie concealed; two shorter antheræ incumbent, roundish, compressed. Pistil—germen roundish; style filiform, in the same situation with the stamens, but longer; stigma blunt, bent in. Pericarp—capsule roundish, mucronate, oblique, two-celled, opening at top; partition contrary. Seeds several, ovate, angular; receptacle sublobular, in the base of the capsule.

Essential character: Calyx—five-cleft; capsule two-celled, mucronate, oblique; seeds coated.

The "Common, or Heath Lousewort," or the "Red Rattle," the "Pedicularis sylvatica," has the stem branched, calyxes oblong, angular, even; lip of the corollas cordate; stem very short, branches from the root, long, spreading close to the ground; leaves simply pinnate, with roundish, acutely serrated spines; floral leaves deeply divided, segments toothed; leaves of flowers crowded. The plant flowers in June, and is found on wet pastures, heaths, and woods, in most parts of Europe.

This weed may be got rid of by removing the wetness of the land by draining, and by top-dressing the surface with compost manures.

27. SELFHEAL,

Or the "Prunella" of botany, is a very abundant weed on poor clay soils, in pastures of two and three years. The plant belongs to the class and order "Didynamia gymnospermia" of Linnæus, and the natural order "Labiatæ" of Jussieu.

Generic character: Calyx—perianth one-leaved, two-lipped, shorter in the throat, permanent; upper lip flat, wider, truncate, very slightly three-toothed; lower lip erect, narrower, acute, semibifid. Corolla—one-petalled, ringent; tube short, cylindrical; throat oblong; upper lip concave, entire, nodding; lower lip reflex, trifid, blunt; middle segment wider, emarginate, serrate. Stamina—filaments four, awl-shaped, forked at top, two of them a little longer than the others; anthers simple, inserted into the filaments below the top, as it were on another branch. Pistil—germen four-parted; style filiform, with the stamens bending to the upper lip; stigma bifid. Pericarp—none; calyx closed, containing the seeds. Seeds four, subovate.

Essential character: Filaments forked at the apex: an anther on one of the forks; stigma bifid.

The "Common Selfheal," or the "Prunella vulgaris," has the root perennial, and very fibrous. The whole plant is thinly set with hairs, the hairs upright and white; stem from six to twelve inches high, upright, commonly branching from the very bottom, hairy, purplish, especially towards the top; branches in pairs at each joint, brachiate, ascending; leaves bluntish, hairy, obsoletely toothed or repand; petioles channelled above, and hairy along the edges. The flower is violet-coloured, with a white tube, and easily falls. Seeds smooth, brown, terminated by a white point. Flowers from June to August, and found in meadows and pastures in most parts of Europe. The size varies much in open, exposed situations; it is short and trailing, but where drawn up among high grass, and especially in woods, it is upright, and a foot high.

In permanent meadows this plant may be banished by top-dressings, and in pastures of a few years' duration it will yield to the effects of a careful fallowing of the land.

28. WILD CAMPION,

Or the "Lychnis" of botany, is a weed of very frequent abundance in pastures formed from ploughed lands. The plant belongs to the class and order "Decandria pentagynia" of Linnæus, and the natural order "Caryophylleæ" of Jussieu.

Generic character: Calyx—perianth one-leaved, oblong, membranaceous, five-toothed, permanent. Corolla—petals five; claws the length of the calyx, flat, margined; border often cloven, flat. Stamina—filaments ten, longer than the calyx, alternately shorter, each of these fixed to a claw of each petal; antheræ incumbent. Pistil—germen subovate; styles five, awl-shaped, longer than the stamens; stigmas reflex against the sun, pubescent. Pericarp—capsule approaching to an ovate form, co-

vered, one, three, or five celled, five-valved. Seeds very many, roundish.

Essential character: Calyx one-leaved, oblong, even; petals five, with claws and a sub-bifid border; capsule five-celled, in most one-celled.

The "Wild Red Campion," or the "Rose-coloured Lychnis," has the flowers dicœcious; capsules one-celled, roundish; root perennial, the thickness of the little finger, white, of a slightly acrid and bitter taste, furnished with numerous fibres; stalks several, upright, from one to three feet high, round, hirsute, jointed, purple, the joints swelled; the uppermost branches forked.

The "Common Campions" are red and white in colour; they are not common on permanent meadows, and they are easily and effectually banished from ploughed pastures by a careful fallowing of the land.

29. DYERS' BROOM,

Or the "Genista" of botany, is a very abundant weed on strong soils and moist pastures. It belongs to the class and order "Diadelphia decandria" of Linnæus, and the natural order "Leguminosæ" of Jussieu.

Generic character: Calyx—perianth inferior, of one leaf, small, tubular, two-lipped, the upper lip with two teeth more deeply divided, lower with three nearly equal teeth. Corolla papilionaceous; standard oblong, remote from the keel, entirely reflexed; wings oblong, lax, shorter than the other petals; keel straight, emarginate, longer than the standard. Stamina—filaments ten, all united, emerging from the keel; anthers simple. Pistil—germen oblong, enveloped by the common filament; style simple, directed upwards; stigma acute, involute. Pericarp—legume roundish or oblong, turgid, of one cell and two valves. Seeds several, mostly kidney-shaped, with a smooth elevated border round the scar.

Essential character: Calyx two-lipped, the upper lip with two teeth, lower with three; standard oblong, bent backwards from the rest of the flower.

This genus of plants are mostly European—shrubby, with tough angular stems and branches, either ternate or simple leaves, and yellow flowers. The species are twenty-five in number, partly unarmed and partly furnished with spines: the spinous ones have all simple leaves. Three "Genistæ" are natives of Britain.

The "Genista tinctoria," or "Dyers' Green Weed," is the most common in England, and grows chiefly on dry pastures. It is refused by no grazing animals but sheep, and it is supposed to give a bitter flavour to the milk of cows that feed upon it. It is rooted out by raising the plants by means of spades and forks. The plant is not unfrequently retained for its beauty, as imparting to the pasture a varied appearance. It is nowhere abundant or troublesome, and does not engage much attention or trouble.

30. ORCHIS,

Plants of several kinds, is common on moist meadows. The plant belongs to the class and order "Gynandria monandria" of Linnæus, and the natural order "Orchideæ" of Jussieu.

Generic character: Calyx—perianth superior, of three spreading leaves, the uppermost vaulted. Corolla—petals two, often approximated or attached to the upper lip of the calyx. Nectary—a spreading lip, with a tubular spur behind. Stamina—anther large, oblong, erect, attached in a parallel manner to the summit of the style, of two cells opening in front, the masses of pollen club-shaped, attaching themselves each by its taper base, to one or two glands, to the stigma, in one and the same pouch; style columnar, short; stigma below the anther, convex, oblique. Pericarp—capsule oblong, with three ribs, of one cell, and three valves, splitting by three lateral fissures. Seeds numerous, minute, each with a chaffy tunic.

Essential character: Upper leaf of the calyx vaulted; lip of the nectary with a posterior spur; anther terminal, parallel; masses of pollen stalked, their bases approximated within a simple pouch.

The "Orchis" is a very extensive genus, containing fifty-two species, in five divisions. The most common in Britain, in damp shady meadows, are the "Orchis pyramidalis" and the "Orchis maculata," or the spotted orchis. The former has the bulbs undivided, lip of the nectary two-horned, trifid, equal, quite entire; horn long; petals sub-lanceolate; bulbs ovate; stem from eight to fifteen inches high, round or slightly angular, smooth and firm, almost covered with leaves; flowers numerous, about eighty, crowded in a short blunt cone, forming a most elegant termination to the stem—deep flesh colour or pale purple; the leaves are linear-lanceolate, and of a silky glossiness, and the bulging protuberances on the lip of the nectary give a very distinguishing character to the species. Flowers in June and July.

The "Orchis maculata," or the "Spotted Orchis," has the bulbs palmate, spreading, horn of the nectary shorter than the germen, lip flat, dorsal petals erect; bulbs palmated, compressed, with the segments much divaricated; stem solid, from eight to eighteen inches high, the lower part round the upper somewhat angular, lower leaves embracing the stem, lowest constantly short, broad, and blunt—the next considerably longer, bluntly lanceolate, above these more acutely lanceolate—upper ones very narrow, and apparently sessile; but the margins are decurrent, whence the angular appearance

of the stem; beneath they are silvery green, with parallel green nerves; above pale green, often partially covered with the same silvery skin, marked with numerous reddish brown spots, mostly oval and transverse, but sometimes irregular: flowers numerous, about forty, in a loose conical spike; corolla usually pale purple; anthers green. It flowers in June and July.

These plants grow chiefly in woods, and on damp meadows. On dry pastures the size is reduced to one-half, and has fewer flowers. All grazing animals refuse to eat them. The roots being strictly perennial, and the plant being seldom propagated by seed, the eradication consists in raising the roots by means of small spades, and then destroying them. The stalks and leaves are juicy, and retard the process of hay-making. The plants seldom occur to the farmer, but are confined to the damp grounds of parks and demesne lands, that are yearly mown, where the beauty of the flowers saves the weeds from destruction or molestation.

31. SEDGE GRASS,

Or the Carex of botany, is very common on old, sour, moist, clayey lands of the meadow and pasture kind, that are undrained and unimproved. It belongs to the class and order Monœcia triandria of Linnæus, and the natural order Cyperoideæ of Jussieu.

Generic character: Flowers dispersed in one or more oblong, imbricated catkins: the male and female in some species are the same, in others on different catkins. Male—Calyx glume, one-valved, one-flowered, lanceolate, acute, concave, permanent. Corolla none. Stamina, filaments three, bristle-shaped, erect, longer than the calyx; anthers erect, long, linear. Female—Calyx as in the male. Corolla, petals none. Nectary inflated, oblong, egg-shaped, contracted upwards, opening at the tip, sometimes with two teeth, permanent. Pistil—germen three-sided, within the nectary; style simple; stigmas either three or two, awl-shaped, incurved, long, acuminate, pubescent. Pericarp none, except the enlarged nectary which protects the seed. Seed single, acutely egg-shaped, most frequently three-sided, one angle often less than the other.

Essential character: Seed enclosed in the permanent nectary.

These plants are very nearly allied to the grasses, and agree with them in their general appearance, leaves, and placentation. They are, however, of a much harder texture, and the stem is not hollow, but filled with a spongy substance, and it is frequently three-cornered. The difference in the fructification is very considerable, and the stem has no joints, which is the never-failing distinction of a true grass plant. The sedge grasses are perennial, and flower from April to August. They grow in wet, swampy grounds, in bogs, fens, and marshes, or by the sides of ditches and rivers, or in moist woods; some few, however, affect heaths and hilly pastures. The plants are eaten by no grazing animal, and seem produced by Nature from a principle in her economy that a bad plant is better than none. On getting quit of the superfluous moisture in the ground, and by top-dressing the surface, the plants will commonly give way to a finer and more valuable herbage.

The sedge grass, though generally reckoned a weed, is not without its use. The herbage is very coarse and harsh, and relished by no animal. The roots give stability to bogs; the stems are used for covering hovels and ricks, for lighting fires and heating ovens, and for tying young hop plants to the poles. In Lapland, the inhabitants comb and dress some species of sedge as we do flax, and use it as a defence against the rigours of the climate.

32. BLACK KNAPWEED,

Or the Centaurea of botany, is a common and abundant weed in moist and cold meadows and pastures. The plant belongs to the class and order Syngenesia polygamia frustranea of Linnæus, and the natural order Cinarocephalæ of Jussieu.

Generic character: Calyx common, imbricated, roundish; scales variously terminated. Corolla, compound, floscular, florets differing in form; those of the disk hermaphrodite, numerous; those of the ray fewer, loose, larger, funnel-shaped, constantly abortive. Tube of the hermaphrodite florets filiform; border bellying, oblong, erect, terminated by five linear erect segments. Tube of the abortive florets slender, gradually enlarging, recurved; border oblong, oblique, unequally divided. Stamina of the hermaphrodite florets—filaments five, capillary, very short; anthers united into a hollow cylinder the length of the petal: of the abortive florets none. Pistil of the former—germ small; style filiform, the length of the stamens; stigma very obtuse and projecting in a point, in many species bifid: of the latter, germ very small, style scarcely any, stigmas none. Seeds of the fertile florets solitary. Down in most species feathered or capillary. Receptacle bristly.

Essential character: Receptacle bristly. Florets of the ray funnel-shaped, larger, abortive.

The common pasture weed is the Centaurea nigra of botany, which has the calyxes ciliate, with the little scale ovate; cilias capillary, erect; leaves lyrate, angular; flowers floscular. Stem, two to three feet in height, angular, scored, slightly downy, often tinged with purple. It has many provincial names, as "knap weed," "knop weed," "knob weed," "horse knops" (all from "knob"

or "nob"—*a head*); also "hand heads," "hand irons;" and in Scotland it is called "horse knot." It is a very harsh stubborn plant, seldom touched by cattle, either green or in hay, and is with difficulty extirpated. It is perennial, and matures an abundance of seeds.

The seeding of the flowers must be prevented by cutting the plants when half-grown by the scythe or hand-sickle, and the roots must be raised and destroyed by spades and forks. The plant grows on strong damp loams of good quality, that have much clay in the composition, and also in the latter designation of lands where the situation is dry and the exposure arid. The extirpation is not difficult, as the plant is not of a very keen growth, and the roots not quickly or durably vivacious.

33. WOOD ANEMONE,

Or Meadow Anemone, the "Anemone nemorosa" of botany, is a plant very common in meadows, though disregarded by farmers. The plant belongs to the class and order "Polyandria polygynia," of Linnæus, and the natural order "Ranunculaceæ" of Jussieu.

Generic character: Calyx—none. Corolla—petals in two or three rows; three in a row, somewhat oblong. Stamina — filaments numerous, capillary, half the length of the corolla; antheræ, twin, erect. Pistil—germs numerous, in a head; styles, acuminate; stigmas obtuse. Pericarp—none; receptacle globular or oblong, hollowed, and dotted. Seeds very many, acuminate, retaining the style.

Essential character: Calyx, none; petals, six or nine; seeds, many.

The "Wood Anemone" has the seeds acute, leaflets gashed, stem one-flowered. The root is perennial, and the height of the whole plant is from five to ten inches. It grows in woods, among bushes, in hedges, and in pastures; and flowers in March, April, and May. In fine clear weather the blossoms are expanded, and become so erect as to face the sun; but in wet weather they are closed, and hang down. The plant is acrid, and in some degree poisonous. Horses, cows, and swine refuse it.

The root being perennial, must be raised by spades and forks, and destroyed. But such plants generally yield to good top-dressings of the surface and pasturing of the ground with sheep, assisted by folding the animals, in order to deposit the excrements regularly over the surface.

34. WATER COWBANE,

Or the "Cicuta" of botany, is a plant of a poisonous nature, and communicates an unpleasant odour to the milk of cows that eat the plants. It belongs to the class and order "Pentandria digynia" of Linnæus, and the natural order "Umbelliferæ" of Jussieu.

Generic character: Umbel universal, roundish; rays very many, equal, partial, roundish, with very many equal setaceous rays; involucre universal, none partial, many-leaved; leaflets bristly, short; perianth proper scarcely visible. Corolla universal, filiform, floscules all fertile. Proper of five ovate inflected, nearly equal petals. Stamina—filaments, five, capillary, longer than the corolla; antheræ simple. Pistil—germ inferior; styles, two, filiform, longer than the corolla, permanent; stigmas headed. Perianth none; fruit subovate, furrowed, bipartite. Seeds, two, subovate, convex, and striated on one side, flat on the other.

Essential character: Fruit subovate, furrowed.

The most common species is the "Cicuta virosa" or long-leaved water-hemlock, which has the umbels opposite leaved; petioles margined, obtuse. Stem round, hollow; two, three, and even four feet high; striated, smooth, reddish towards the bottom, dichotomous. Leaves sheathing, a foot and a half long, and nearly a foot broad; the lower on long hollow petioles, the uppermost almost sessile, bipinnate. Some of the pinnas simple, others bifid or trifid; the serratures sometimes brown. The end leaf cut into three to the bottom. All smooth.

The plant flowers in July and August, and is one of the rankest of our vegetable poisons. Some writers have known cows killed from eating it; and that horses and sheep eat it with safety. It must be very carefully removed from pastures, by digging and destroying the roots.

35. MEADOW SAFFRON,

Or the "Colchicum" of botany, is a very common weed in pasture and grass lands. The plant belongs to the class and order "Hexandria Trigynia" of Linnæus, and the natural order "Junceæ" of Jussieu.

Generic character: Calyx—a spathe. Corolla monopetalous, tubular, very long, springing immediately from the root; border campanulate, deeply divided into six lanceolate, egg-shaped segments. Stamina — filaments, six, awl-shaped, shorter than the corolla, inserted into the tube; anthers oblong, four-valved, incumbent. Pistil—germen superior, situated at the bottom of the tube of the corolla, contiguous to the root below the surface of the ground; styles, three, a little longer than the stamens; stigmas reflexed, channelled. Pericarp—capsules three, inflated, coherent in their lower part, slightly separated towards the summit, opening longitudinally on the inner side. Seeds numerous, almost round, wrinkled.

Essential character: Calyx—a spathe. Corolla—six-cleft tube, springing immediately from the root. Capsules three, connected, inflated with many seeds.

The "Common Meadow Saffron," or the "Colchicum autumnale," has the leaves flat, lanceolate, erect. Root bulbous, fleshy, milky; perishing after the ripening of the seeds, but first throwing out a lateral bulbous shoot, which produces the flowers of the ensuing year. Flowers generally purplish, opening in the latter end of September, without stem or leaves; leaves appearing in the ensuing spring a foot long, broad, flattish, obtuse, dark-green, upright, three or four together, sheathing; capsules rising with the leaves, and ripening the seeds in May. The smell of the plant is very strong and nauseous, and the succulent herb is poisonous to man and beast.

In an agricultural point of view, the plant is certainly a noxious weed to the farmer; not, indeed, on account of its poisonous qualities; for neither cows, horses, nor sheep will touch it; but on account of its broad leaves, which occupy the place of better herbage. The only method of getting rid of it, is to dig up the bulbs with a spade, and to replace the earth when they have been separated from it.

36. GOOSE TANSY,

"Silver weed," or "feathered cinquefoil," is the Potentilla of botany, a very common weed on pastures recently laid down from the arable state. The plant belongs to the class and order Icosandria polygynia of Linnæus, and the natural order Rosaceæ of Jussieu.

Generic character: Calyx, perianth, one-leaved, flattish, ten-cleft; the alternate segments smaller, reflex. Corolla—petals five, roundish, spreading, inserted by their claws into the calyx. Stamina—filaments twenty, awl-shaped, shorter than the corolla, inserted into the calyx; anthers elongate, lunulate. Pistil—germens numerous, very small, collected into a head; styles filiform, the length of the stamens inserted into the side of the germ. Stigmas obtuse. Pericarp none. Common receptacle of the seeds, roundish, juiceless, very small, permanent, covered with seeds, inclosed within the calyx. Seeds numerous, acuminate, wrinkled.

Essential character: Calyx ten-cleft; petals five; seeds roundish, naked, fastened to a small juiceless receptacle.

The common species, or the Potentilla anserina, has the leaves interruptedly pinnate, serrate, silky underneath; stem creeping, peduncles one-flowered. Root fibrous, and penetrating deep; stems creeping, round, jointed, reddish, downy; leaves silvery, white underneath; petals yellow, obtuse, twice the length of the calyx. Flowers from June to September. This plant thrives best on damp poor clays, where water stagnates, and then dries up; it is held as a mark of the sterility of land. The roots are sweet, like parsnips, and are used as bread. Cows, horses, and swine are said to eat, and sheep refuse it. The name would seem to imply that geese are fond of it.

In all arable lands, weeds must be extirpated by careful fallowing; and on pastures, top-dressing the surface with composts, eating it bare with sheep, and the folding of the animals for the purpose of depositing the excrements will in most cases remove the weeds of the smaller size, as is the present plant.

37. BISTORT,

Or the Polygonum bistorta of botany, is a very frequent weed on moist meadows. The scientific description of the genus has been given under the name as an annual weed. The present plant is perennial, with a thick woody, twisted root, and of an astringent quality. Stem quite simple; spike solitary; leaves ovate, waved, running down in the footstalks. Frequent in moist hilly pastures over the northern parts of Europe, flowering in June. Stems about a foot and a half high, each having one erect, cylindrical, thickish, obtuse spike; a dense cluster of not inelegant rose-coloured flowers, destitute of scent. Stamens eight, styles three. The leaves are three or four inches long, and above one broad, being entire glaucous beneath; the radical ones on long stalks, and most numerous.

The digging of the roots is the only effectual mode of eradication.

38. OX-EYE DAISY,

"Great white daisy," the Chrysanthemum leucanthemum of botany, is a very common weed on the best and soundest pastures. The scientific description of the genus has been given under the name as an annual weed. The herbage is not grateful to any grazing animal; the stem is erect, and branched; leaves embracing the stem, oblong, obtuse, gashed, pinnatifid at the base, root ones inversely egg-shaped, petioled. Root perennial, fibrous, somewhat woody; stems about two feet high, furrowed with red angles, somewhat hairy; leaves dark green, glossy, smooth; upper ones alternate; flowers showy, large, solitary, terminal; seeds cylindrical, entire, destitute of a marginal rim, furrowed, black, with white ribs; receptacle convex. A native of dry pastures and meadows in most parts of Europe; it varies much in different situations, and the varieties and kindred species have caused much discordance.

When the plants are few, the roots may be drawn; but where the weed is very abundant, the surface must be heavily top-dressed, eaten bare with sheep,

and improved by folding the animals over it. This application, as before observed, tends to banish the succulent-leaved herbage, and to produce the grassy plants of the earthy fibre.

39. CROWSFOOT,

Or the Ranunculus of botany, occurs in great abundance over the best meadows and pastures, in two principal species, with perennial roots. The scientific description of the genus has been given under the annual plant of the name. The two plants are not easily distinguished—the one is the "bitter crowsfoot," or the Ranunculus acris; the other is the "bulbous-rooted crowsfoot," or the Ranunculus bulbosus, which grow much intermixed. It is doubtful if grazing animals relish these plants to eat, as they cannot avoid them in the mixed herbage. The acrid pungent quality may be useful in stimulating the digestive organs, and when made into hay, the plants are said to lose the pungent quality, and the brightness of the blossoms shows that the hay has been well got. The seeds produced are very numerous, and the roots are strictly perennial. The only mode of eradication is by heavy top-dressing, and by folding sheep on the ground, as has been previously recommended.

40. RAGWORT, COMMON,

Or the "Senecio Jacobea" of botany, is a very common weed on good lands. The scientific description of the genus of plants has been already given under the annual weed of the name. The present plant has a strictly perennial root, fibrous. Stem erect, branched, striated, leafy, smoothish, corymbose, many-flowered. Leaves mostly smooth, dark-green, double pinnatifid, somewhat lyrate, divaricated, toothed, cut into various spreading segments. Flowers very numerous, of a bright golden yellow, terminal, corymbose. A cottony web, more or less dense, frequently invests the flower-stalks and calyx. The weed is abundant in all kinds of waste grounds, flowering in the height and drought of summer, when it forms a contrast with the surrounding scorched and withered herbage. Horses and cows constantly refuse the herbage as food, and sheep will eat it only when young. It is a sure mark of the good quality of land. Mowing of the stems prevents the perfection of the seeds, but does not destroy the roots. This is best done by eating down the plants when young, with sheep, or pulling the roots after soaking rains; and they must be raised very carefully, as the smallest fibre being left, the roots will grow afresh.

41. MOSSES,

Or the "Musci" of botany, are the greatest pests of damp and heavy land meadows, and also on dry pastures. The plants belong to the cryptogamic class of vegetables, and form a very extensive order. Herb leafy; corolla, like a hood, clearing the style, and covering the capsule, which is closed with a lid. Roots fibrous and branched. They are not confined to the base of the plant, but are abundantly protruded in fine minutely-jointed branched tufts from various parts of the stem, which, no doubt, imbibe nourishment as well as moisture. The stem is often simple, and frequently branched. Leaves invariably simple and undivided, the margin only being serrated, and in some few instances being toothed. The fructification is sometimes lateral, and in that case always axillary, but sometimes terminal.

Various plans have been adopted and recommended for the extirpation of mosses. The most plausible is to scratch and tear the surface of the ground with sharp-toothed harrows, to apply a heavy top-dressing of manure, and to sow the seeds of grasses. Another cure consists in folding sheep on the ground. But these methods are only temporary; for in a few years the mosses again appear, and usurp the dominion of the surface. Experience has shown that breaking up the land, and relaying it with fresh seeds, is the only effectual cure, after the land has been well fallowed, cleaned, and manured, subsequently to the bearing of culmiferous and leguminous crops. This mode is the most effectual, and consequently the most economical in the end.

The large perennial plants that grow on road-sides, and on the banks of hedges and fences, must be all cut by midsummer, as the perfected seeds are blown by the wind, and carried by birds, and consequently infest the meadows and arable fields. A compulsory clause should be inserted into every lease or agreement of holding land, that these weeds be all cut by Midsummer on every road-side and fence bank on the farm, and on the sides of the main roads; and the ditches must be cleared by the notice of the commissioners. Seeds of weeds are perfected in these places in quantity sufficient to stock the whole neighbourhood, and a careful farmer is often put to very considerable expense in paying for his neighbour's neglect. It is part of the land-steward's business, or of his deputy, to see the performance of such very necessary clauses on every estate of landed property.

Weeds should be removed from all unimproved lands, as a step to the reclamation, by removing the wetness, consolidating the surface, and substituting a better herbage. The large herbaceous stems will claim the first attention, by being cut when about half grown, and before the seeds are formed. Close grazing is very useful, by the animals eating the young herbage, and stopping the

growth of the plants. Little expense is incurred, and a beneficial purpose is promoted.

Weeds have been divided into two very easily remembered sections of "annual and perennial." The first division is propagated chiefly by yielding a profusion of easily ripened seeds; the second spreads mostly by the roots; while some plants in both sections possess the two properties in a very considerable degree. The first division of plants requires the care of eradication to be bestowed before the seeds are ripened, or rather before they are half-ripened; for the vitality is very precocious, and this precaution must be used in completely fallowing the lands, and by drilling the crops, in order to afford opportunities of hoeing and hand-weeding. And when the plants are very abundant, the best way is to carry them off the land, after being cut by the hoe. The perennial weeds are larger than the annual, and are removed by the stems being pulled by hand, or cut with scythe or sickle, and by the roots being raised by the spade or forks, and destroyed. These two modes will comprehend the general destruction of weeds, according to the nature of plants.

ON HOEING WHEAT.

The late unprecedented lack of rain-fall, prevalence of searching N.E. winds, and consequent dryness and lightness of the soil, have given rise to more than usual debate concerning the propriety of hoeing wheat. After all the pains bestowed upon rolling, consolidating with the clod-crusher, and treading with sheep, in order to prevent the dusty earth from flying away before the gales, exposing the roots to injury and destruction, is it right to loosen the surface with the hoe? Will hoeing effect more benefit by earthing-up and sheltering the half-withered plants, than damage by admitting the wind to penetrate still deeper with its drought? Is the hoeing which is now being done merely set about because it is part of our habitual routine? or has it been undertaken with a reasonable expectation of benefiting the crop? We are of opinion that it is better to err on the side of too much hoeing than of too little. But people have very different views of the nature and use of hoeing. On some kinds of soil, more particularly when situated in the moist growing climate of the southern and western counties, hoeing must be resorted to, as a battle against weeds: on other soils, and under different climatic influences, farmers see no use in breaking up the spaces between their wheat-rows, and burying many plants under the loose mould. In reality, however, the questions of "weeding" and of "hoeing" are distinct, the latter being fundamentally a fertilizing tillage operation, or one which is intended to promote the supply of nourishment to plants, and also mechanically open and prepare the soil to receive the spreading roots in search of that food. The cutting and destruction of shooting weeds is a secondary and accessory advantage. The prime object of hoeing wheat is to pulverize and loosen the crust of soil which has lain undisturbed for several months, so that the plants may have a free mould into which to send out their coronal rootlets, and so that rain and dew and air may find readier ingress to the subsoil, which needs a continual renovation of its fertility from them.

In our climate, wheat must be sown in autumn, in order to give it sufficient start in the spring to ensure a plump grain at harvest; but for several months after sowing, it makes very small progress in growth; and by the time that the plants begin to shoot out vigorously in spring, requiring an open and finely-divided soil in which to strike their tender roots, the land has become more than ever solidified and closely knit. Hence, hoeing is needed, to stir, disturb, and crumble it.

Some persons are afraid of covering the more backward plants with earth, and so killing them, unless the operation be very carefully done; but when strong winds have blown away much soil and exposed the roots, hoeing shelters and protects the plants by this very earthing-up. One of the chief objections commonly brought against hoeing is that it "lets in the drought;" but it is evident that rain will penetrate much sooner and far deeper into pulverized than into hard ground. In the absence of rain, and when the soil can absorb moisture only from the humid atmosphere, and sucks in the scarcely perceptible dew, it is also true that ground when hoed imbibes much more moisture than when its surface is left as an unbroken crust. This any one may determine by hoeing a plot alongside an unhoed plot, and after some days of dry weather examining the soil for a few inches in depth, when the pulverized earth will be found moister than that left hard.

Hand-hoeing is, in fact, a method of obtaining the same sort of advantage for wheat sown in narrow rows that is derived from horse-hoeing other crops which are drilled at wider intervals; and although it was left for Jethro Tull to originate the system of *drilling* by which hoeing was rendered practicable, the practice of tilling amongst corn

to encourage its growth was certainly known in ancient times. Pliny says: "We must not omit a particular method of ploughing, at this time practised in Italy, beyond the Po, and introduced by the injuries of war. The Salassi, when they ravaged the lands lying under the Alps, tried likewise to destroy the panic and millet that had just come above ground. Finding that the situation of the crop prevented them from destroying it in the ordinary way, they ploughed the fields; but the crop at harvest being double what it used to be, taught the farmer to plough amongst the corn."

"Ploughing" amongst corn, however, was as wasteful a practice as firing a pigstye for the sake of the roast pig—a custom once followed—according to Charles Lamb—by the Chinese; hence we have implements specially adapted for this tillage amongst growing crops. Hand-hoeing is the most usual, and perhaps, all things considered, the best method: only the farmer must watch his men carefully, so that, if at piece-work, they do not draw "long strokes," covering up the shorter and weaker plants, and damaging most of the others. Where the plant is thin and requires careful treatment, it may be worth while to adopt the slow and expensive plan of hoeing "by the day." For cheapness we would advise the employment of a horse-hoe, such as Garrett's admirable implement, or Harradine's smaller and simpler one; though there are many difficulties to be overcome in their first trial.

THE EXTENDED USE OF STEAM POWER FOR THE PURPOSES OF AGRICULTURE.

We make no apology for returning to the consideration of the extended use of steam power for the purposes of agriculture. The importance of the subject has of late become so apparent, and the agriculturist has evinced so lively an interest in its further development, as to well warrant us in ascertaining how far this is either practicable or desirable. From thrashing, cutting, grinding, and bruising, steam now remains to be applied to the cultivation of the soil, for ploughing more especially, from its being an expensive and tedious operation; and still more on account of the wide field presented for its employment in such a department.

The steam engine is in itself a greater weight than is usually drawn upon a field by a team of horses, and the merely moving it to that portion of the farm where it is required implies such a force as small farmers do not possess; and, therefore, whenever its application becomes general, it must be upon the same principle as is now adopted with locomotive engines for thrashing and other purposes. Persons will purchase and let them upon hire, and thus offer an inducement to farmers of occasionally employing them whenever they may require them as an adjunct to the usual horse labour, or whenever extra work has to be performed, that requires a larger amount of force than is ordinarily employed to execute it. Of this description draining will form an important item, deep and subsoil ploughing, breaking up woodland, hauling chalk, marl, clay, or gravel from pits, road making, &c.; and it therefore is apparent to us that in the production of a locomotive engine it should be made applicable to all these purposes; and we feel sanguine that the enterprise and invention of our engineers will overcome every difficulty, until the final and complete result becomes attained.

There is, however, another element involved: the cost of the application must not exceed that of horses for the various purposes to which it may become applied, unless, as we have before stated, where its occasional use may be of such a nature as to counterbalance the mere extra expenditure attending the operation, or the advantage to be derived by increasing the labour-power of the farm at a time when it could not be rendered otherwise available by any other mode or process at command.

To construct a steam-engine that shall be generally applicable, it ought to be made of as little weight as possible. The wheels by which it is to be carried should be so constructed as to allow them to be superseded by others for travelling upon rails, and sufficiently low to enable the utmost power to be readily applied and economized, with the further advantage of also rendering the engine steady under the greatest strain or resistance during its application. With an engine so constructed, we see no difficulty likely to arise by its traversing a piece of land upon its portable railway, as the work proceeds, without having any additional power to propel it beyond what a single horse might effect, but which, under ordinary circumstances, might easily be effected by the workmen themselves, and as the engine would be required to proceed in one and the same direction until the whole division of the field was finished, a very small extent of tramway would be requisite. And we do not hesitate stating that after having once attained to a ready and easy mode of *applying* the power, that many very expensive processes might economically be

effected. We will, in explanation, at once suppose that it would be required to plough a field to the depth of twelve inches: this would require six powerful horses to accomplish, and would cost from 20s. to 24s. per acre to effect. Again, the cutting drains, two feet in depth might also by the steam-power be worked easily, and, with a plough attached, properly constructed, another foot in depth might, if required, be also attained. Or, hollow drains of two or three inches in diameter might by the plough and draining plough in addition be effected and forced through the solid subsoil to the depth of two or three feet at near intervals—this mode of drainage, to our own knowledge, being equally beneficial as that effected by more expensive modes.

Then, for subsoiling, steam power would be of great utility. The stirring the subsoil to any required depth might be effected; and just in proportion as the force required might be greatest, the cost of effecting it would become proportionately reduced.

It will therefore be seen that a steam power of this description would be required solely upon very large occupations, unless, as we have stated, it could be so far rendered applicable as to accomplish the ordinary ploughing of the farm, as well as the various purposes of harrowing, scarifying, and pulverizing the soil. The operation of ploughing is one that requires great nicety in execution; and it would be difficult to effect it by any machinery so evenly as it can be effected by hand, from the circumstance that every description of soil requires a different application of the power; and it is an operation that, even with the best and most experienced ploughmen, depends upon the nicety of adjustment of the plough to effect the object in the best manner. The accuracy of width and depth of the plit, without also varying an inch from a straight line in a furrow of five hundred yards in length, when effected by a first-rate ploughman, is a marvellous performance, and the nicety of execution of which can never be obtained by machinery, obstructed as it will sometimes be by an undulating surface, by various strata, and atmospheric changes. These will not only require elaborate, but easy adaptation of machinery, as well as competent skill in each particular case, and which nothing less than extensive practice and ability will ever achieve.

It is not with any intention of detracting the efforts of our sanguine agriculturists that we have written in this admonitory style, but rather to point out the difficulties and to weigh the probabilities of success, that we have entered upon the task. We happen to know, to our cost, that experimentalists incur very heavy expenses in perfecting the simplest descriptions of machinery; and the steam-engine is not a power to be trifled with, either as regards expense, or of adapting it to any new purpose; and whoever makes the attempt, should take care to have the engine so constructed as to be applicable to many other purposes, should the one immediately attempted not be successful. As we have intimated, lightness combined with strength will be most essential; for it needs to be recollected that for field cultivation the engine will have to travel over land where no roads exist; and even if they do, of such a nature as to be totally unfit for the moving heavy weights upon. The plough, after all, we should be sorry to part with; and during our day we may still wish it "good speed."

"AGRICULTURAL TEACHERS AND THEIR CONTRADICTIONS."

We have chosen the above heading, not that we intend to differ with a correspondent, "G. B. B.," of the 19th ult. (if we understand him aright), but to take a more comprehensive view of, or rather exemplify more fully, the anomalous state of things to which he directs attention. At the same time, our readers must not expect that we propose the condemnation of "Agricultural teachers and their contradictions;" much less that we are to turn teachers ourselves. Such contradictions are of necessity, so long as the seasons, weather, and practices differ so widely as they do; and as for instruction, experience must always be acknowledged the master-teacher. This latter may truly be said to be the "*pons asinorum*" to successful agriculture, by which both landlords and tenants must enter. The old proverb, for instance, that "they must either serve an apprenticeship or pay an apprentice fee" is still true, and will, it is presumed, continue to be so. The question at issue is to reconcile contradictory practices.

Generally speaking, provincial practices are daily assuming a more uniform character. This arises from the diffusion of agricultural literature; from the successful operation of agricultural societies in introducing improved live stock and machinery into every district; and from the facilities which farmers have lately enjoyed of visiting, by means of steam-boat and railway conveyance, the different provinces, and examining personally the various systems therein practised. The joint co-operation of these agencies is exercising at the present moment a very powerful influence on the anomalous theories to be met with, slowly moulding them to a common rule.

When we, however, confine ourselves to individual provinces and farms, the monotonous routine of anti-

quated times is fast being supplanted by modern improvements, which appear to have no end. Under such circumstances, the contradictory practices with which the beginner is surrounded, render it difficult for him, in the absence of experience, to say which is best, or that which he himself should follow. Diffident of his own judgment, he naturally wishes to confide in that of others, whose experience entitle it to sterling currency; but, unfortunately, how few of such men lift the pen as teachers! Hence his position. Sensible of the unprofitableness of old systems, and the contradictory character and lavish expenditure of new, he feels himself placed between the poet's couplet—

"Death i' the front, Damnation in the rear;"

and, being impatient of delay, very judiciously calls for a commission of inquiry.

The cause of this apparently anomalous state of things is the unprecedented force of progress, furnishing the very opposite from grounds of complaint. At the present moment, for example, it is no easy matter keeping pace with agricultural improvements. The most experienced and successful farmer feels this nearly as much as the beginner. No doubt the latter—on taking a farm or commencing to manage landed property—feels himself in a more conspicuous and isolated position, being called upon to purchase everything new, and fall at once into the most recent improvements of cultivation, manuring, &c.; but after all, the question is a very problematical one whether he, or the farmer who farms under an antiquated system of tenure, occupies the most trying situation. Those who have experienced both will no doubt, conclude that much depends upon special circumstances.

In disposing of questions of this kind, the fact is too frequently overlooked that farmers have something else to do than keep pace with agricultural improvements; and, from the antiquated character of entail laws, too many landlords are unfortunately in a similar position. Both, for example, have to look after their money, lest antiquated statutes place it in the pockets of others who have no right to it, leaving the rightful owners beggars. To lay aside old things, and purchase new because better, is always a specious advice; but so long as the former serve their purpose, and may see the end of the lease, if there be one, the question of an additional investment becomes a speculation, to which farmers have no right to be subject.

Antiquated statutes are thus not only a barrier to progress, compelling farmers to follow practices the very opposite of what they would often otherwise do, but they also throw the progress of experimental science into the hands of amateurs—a still greater obstacle in the way of improvement. This arises from the unsatisfactory performance of experiments, especially in the reduction to practice of chemical propositions, such as manuring and the like, where speculative Liebigdomism can scarcely be confined within any imaginable boundary. The liquid manure systems of Tiptree Hall and Cunning Park may be taken as examples of this kind, where the experiments are even worse than useless from the imperfect manner in which they are performed, being such as can never establish the practice on a reliable foundation.

The question which comes home to me and every other practical farmer is simply this: Will the liquid manure system pay to adopt it during the currency of my lease? and this question the results elicited in Essex and Ayrshire do not solve. The first question with the practical man, for example, is always one of expense; the second, his landlord's acres; and the third, progress. But in the above examples things are reversed; progress taking the lead, while the former two conditions are unfortunately wanting! True it is, that by inspection we can form a rough guess what it takes to work the system after it has been fairly started. But when Tiptree Hall is a partial failure at the commencement, and Cunning Park successful only after several years' operation, the practical question arises, how many years' application would it take to bring my farm to a healthy liquid manure action? Until this question is satisfactorily solved, I obviously run the risk of losing sight of my money.

With regard to the contradiction involved in the advocacy of the two systems of solid and liquid manuring, it is more apparent than real; while the statement "that solid manure is a mistake," is perfectly true, for no class of plants eat solid food. On this point we are not divided with G. B. B., if we understand him aright, as already stated. The anomaly lies, not in the systems, but mode of advocating them, as will readily be seen from the following examples, viz.:—

The liquid-manure drill in dry weather, and the application of bones and guano in wet or moist weather, are two established practices, proving in the most satisfactory manner the value of both systems. And although experience has not as yet given her sanction to the hydrant-and-hose theory as adapted to general practice, we are not aware of a single objection having been raised in any of the provinces to either of the above; a fact which proves that whenever a new proposition is enunciated meriting general support, it will at once unanimously meet with it from intelligent practical men.

On the contrary, every farmer is familiar with the fact that liquid-manure drilling when the soil contains an excess of moisture is "carrying coals to Newcastle," and that bones and guano are inoperative in dry weather. These are realities which no amount of scholastic teaching will ever efface from the mind of the successful agriculturist.

Underground irrigation, again, as involved in Wilkins' system, has from time immemorial met with the approbation of experience in all warm climates. Over a great extent of Southern Asia and Europe, for instance, none of the cereals can be successfully grown without the bottom application of water; and in our own fens and moors it is dammed back in the ditches and drains for the purpose of accomplishing the same object. In all these cases farmers are familiar with the principles on which the practice is founded, and never fail to carry them into effect whenever it is demanded by vegetation and practicable.

In the successful practice of underground irrigation,

however, many obstacles are experienced, some of them almost insurmountable; such as too porous a subsoil, or boggy lands full of springs, or containing an excess of water from capillary action. In scorching climates this excess of water in the latter is sometimes subdued by the summer drought, in time to secure a crop, where poisonous salts are not brought to the surface during winter to prevent it. But in the former case, where water sinks perpendicularly, as in open, sandy, gravelly, and rocky soils, narrow ridges, or seed-beds, and puddling the furrows between them for the water to flow in, is the only alternative—a work too expensive for the generality of cases in this country.

To obviate these difficulties, tiles and socket-pipes have been proposed. We ourselves, before the date of Mr. Wilkins's patent, for example, proposed a herring-bone ramification of pipes down the centre of every ridge, the ribs or lateral pipes branching to each side being sufficiently close to convey to the intervening soil a supply of moisture by capillary action. But, plausible as such may be made to appear on paper, it is otherwise when taken to the field, no less from the quantity of water required, than the difficulty of getting it spread laterally over the bottom. No doubt artificial impervious bottoms could be made, as proposed by Mr. Wilkins, so as to reduce the quantity of water required, and at the same time to distribute it, or the liquid manure, over them, so as to supply the wants of plants. That this is possible, without injuriously deluging the soil with an excess of moisture, will readily be admitted by every fen-farmer who has found the efficacy of damming back the water in his drains; but its expense and practicability, as yet, is rather a problematical question. At the same time, so long as experience has not returned an unfavourable verdict, it ill becomes any landlord or public journal professing to be the exponent of agricultural science, to sneer at the laudable efforts of an honest practical farmer spending his skill, time, and capital in the solution of a question of so much importance to the public weal.

The sentence of condemnation, therefore, cannot be awarded against either the solid or liquid manure system. From time immemorial both have been practised; and, doubtless, will continue to be so while the earth is cultivated. That they are in some measure opposed to each other is plain; but not more so than rainy weather is to dry; and so long as farmers must make provision for both the latter, just so long will they use both the former.

But, while both systems are thus easily reconciled to each other, it is not so easy to bring some of the modes of carrying them out within the circle of science and practice. A very little inquiry here will show anomalies which have no connexion with modern agriculture. We have only to examine the contents of the liquid manure tank to perceive this. As, for example—

Were the pharmaceutical chemist to throw his whole medical herbarium into one receptacle, and the doctor to prescribe only one *decoctum omnium herorum* for all complaints, doubtless both would be set down as charlatans. And yet is not this the liquid-manure practice of Essex and Ayrshire? one infallible decoction for all sorts of soils, seasons, and crops! Granting that the system will ultimately be crowned with success, there is obviously as yet room for progress. The medical world has long monopolized the learned phraseology of the schools; but our liquid-manure friends must now have their share by bottling their decoctions, and labelling them accordingly. At this our readers must not hastily conclude that we are here launching them without a compass into the shoreless sea of novelty; for Mr. Boydell, in his "Treatise on Landed Property," proposes putting the whole sewage of the capital and other large towns into casks, labelling them and sending them to the country per railway: and if this is practicable, how easy a matter would it be to cask the additions required for different kinds of crops and soils, having them labelled and ready for mixing by the time they are required for application! or solid soluble salts might be added to effect the same end, in both cases making the artificial supply of water correspond with the season. The chemistry of plants and manures demands attention to details of this kind before it is possible to reconcile their science and practice to each other.

Again, in these times of analytical inquiry, could not more attention be paid to the analysis of liquid manures, before pronouncing an award as to their value? On this point there cannot be two opinions: for in the absence of such we can neither know the economy or utility of the system — whether, for example, is the waste of raw materials greatest, in the manufacture of solid or liquid manure? The question is a practical one, and every farmer in the slightest degree conversant with chemistry must be aware of its importance, and that until it is chemically and satisfactorily solved, conclusions are worthless, both in seed-time and harvest.

These and many other chemical questions of a kindred character—such as liquid manure action on different soils, climate, plants, &c., &c.—must be solved before the hydrant-and-hose liquid-manure system can receive its diploma from Experience. In discussing the manufacture of farm-yard manure, the fact is too frequently overlooked that the whole soluble matter which it contains, when properly made, is in a suitable form—more so, possibly, than were it improperly diluted in a tank. Does the imbibing of the urine of cattle by litter, for instance, solidify it? or the throwing of sewage into a pond liquefy it? Solidification and liquefaction are two very different processes; and even when dry salts of ammonia or bone earth, &c., are mixed with the soil, how little moisture is required to melt them, and produce the greatest degree of vegetation!

THE SWALLOW.—The unerring love for her young, her confiding nestling against houses, her rapid gyrations in the air, her coming and going with the coming and departing joys of summer, all this has awakened tender feelings towards her, has made her sacred. It is on account of these qualities that so many a fond belief is connected with this bird. Where the swallow nestles no lightning will fall; the plague, she dreams, has taken possession of by death; and whoever destroys her nest destroys in doing so his own fortune, while blessings attend the hospitable protector.—*Studies from Nature.*

FARMERS' ACCOUNT BOOKS.

There are some problems which, even in this age of enlightenment, appear as little likely as ever to be properly solved. We yet puzzle ourselves over the authorship of Junius' Letters; still seek in vain for the philosopher's stone, or the nearest way to the North pole; while we come scarcely a whit nearer that highest pinnacle of a worthy ambition—the discovery of perpetual motion. Descending to every-day life, it is much the same. The sewage of our towns, and its removal, continues, as it long has done, a home question for many of us. The best means of employing our criminal population, the collection of our statistics, the condition of our poor—all these, with many others, involve a riddle of their own, that we are yet but guessing at.

This, however, arises from no want of trying. The English are proverbially a people by no means inclined to "give it up." The only doubt is whether on many occasions they have not failed simply from having attempted too much. Instead of harassing ourselves over the production of some grand nostrum that shall be made to meet and remedy alike the ills of all, how much more might be accomplished by applying ourselves, at least in the first instance, to our own especial case! The agriculturist has one of these said problems of every-day-life now almost as far as ever from being mastered. The times, nevertheless, require more and more that it should be. The farmer should be a mere farmer no longer. He should be a man of business, of commercial habits, with a profit and loss side to his book: knowing well what he makes and spends, and ever ready with that best of arguments—at any rate for his own guidance—a balance-sheet.

The farmer, in a word, should keep good accounts. Does he do so, or does he know how to? If not, it is from no lack of teaching. Taking the whole range of agricultural topics, and we should suppose that on no subject has there been so much time, temper, and paper thrown away as on this said matter of accounts. We should be afraid to say how many plans and books we might be able to collect from our own stores. We should like even less to add how few of these have, even in any way, answered. According to one of our informants, the waste in paper and print alone is "an actual sin;" while the most direct proof of the value of these several systems is that comparatively nobody will adopt them. Going even to the best authority, we are assured there is now lying at the Rooms in Hanover-square a ton or so of an account book, which was published but a very few years since under the approval of the Royal Agricultural Society. The members cannot be induced to take to them.

Is this the fault of the farmer, or rather that of his ingenious friends? We are inclined to attribute it to the latter. They have here again fallen into the common mistake of attempting too much. Each one, with some peculiar crotchet of his own, elaborates the idea to a degree that can entice but few to follow him. We have now before us a method for keeping farm accounts in four volumes, of which the great secret appears to be that any one intending to adopt them must, as a preliminary measure, spend ten or twelve months under the tuition of the inventor! If he does not, he is complacently assured that he will never be equal to carrying them on. This too, unhappily, is no isolated case. Almost all farm account-books are wanting in what Byron called that essential of greatness—simplicity. So complex, divided, and sub-divided to meet every possible item do they become, as, in ninety-nine times out of a hundred, to defeat their own object and meet none at all. Without the twelve months' education of our candid friend in the four volumes, scarcely one could be brought to a practical working. Despair and confusion soon take possession of the tyro, who must ultimately have to balance his year as the Welsh squire did his week at Chester:—"Turnpike, 1½d.; sherry and biscuit, 8d.; holding horse, 6d.; and 'sundries,' £19 18s. 8½d."

If the Agricultural Society of England has gone so far as a model book, that of Ireland has at least owned to the importance of the subject with a discussion upon it. This, introduced by Mr. Hamilton, with a full admission of the difficulty he had to encounter, quickly extended to something beyond what we should consider simply "farm accounts." The English farmer, indeed, could gather but little to his advantage from the report, referring as it does chiefly to the duties of the steward, or better sort of bailiff as we should here call him. Even with his many avocations, we imagine the plan advocated must be far too complicated and tedious to be profitable. Nothing is so prone to make a working bailiff a "fiddler" as this continually driving him to pen and ink. At best, either, the discussion of the Irish Society turned rather on the accounts to be kept by him who was farming for another than for himself.

In recommending any system of account-keeping to the practical agriculturist, we should ever bear in mind that he is not by profession an Accountant. Beyond this we must remember that, from a variety of circumstances so peculiar to such a pursuit, it will be next to impossible to adopt one registered system alike to every locality and custom. Here, we repeat, are the two grand errors that are more to be avoided than positively attacked. Much, in any case, remains to be done. If our present models, for the reasons we have stated, are not likely to command attention, the introduction of some safer methods of keeping fair farm accounts is still, we believe, a common want. The easiest way of achieving this is perhaps, after all, by discussion. Our different societies, to be sure, might do something by the offer of a premium for a plain, practical treatise on the subject; for, despite what has already been written, this has yet to come. The Farmers' Clubs, however, might go more directly to the point, as each district considered what was best for its own use. We are glad to say there are but few of such meetings now but where some member has the will and the way to instruct his fellows.

Simplicity we would again impress as one of the first of means towards a successful result. A bailiff's account, after all, may be well embraced in one book; and, indeed, one of the most complete we ever saw between an agent and his employer ran on with merely a dividing line between the two. On the one side the agent charges himself with the *whole* amount of the rental, and discharges himself on the other with all payments made, and arrears of rent remaining; thus showing the entire amount of the rental and arrears, with a classified list of all actual outgoings. The estate was that of one of our Scotch dukes; while the form, we believe, is one in common use north of Tweed.

We have been induced to dwell again upon this matter, not only from the meeting in Dublin, but also on the publication of another Farmers' Account Book. This bears the name of Mr. John Smyth, of Bygrave, Hertfordshire; a gentleman who has evidently a great turn for figures, but who has hardly yet adapted this proficiency to the purpose it is here employed upon. He modestly asks for suggestions, and we have little doubt but he may have them in plenty. It is a suggestive subject.

THE NEW CHINESE POTATO.

BY W. W. TYPE.

We have all of us our favourite theories on particular subjects; and there are few people who have not cherished one of their own concerning that precious esculent, the potato, and its mysterious "disease." Having arrived at last at a crop of theories on the subject as multiform as the varieties to which that singular root itself has yielded in the progress of cultivation—and it yields a number from the seed of every plant—the bewildered public will be scarcely less glad of the chance of escaping from it altogether to a new and preferable substitute, than they would be of the actual discovery of a remedy for the formidable disease by which it is afflicted. To our intelligent neighbours, the French—who are, next after the Chinese, perhaps the best and most enterprising as, difficulties considered, they are doubtless the most successful gardening husbandmen in the world—we are indebted for the fairest prospect of this refuge from potato famine that has yet been propounded. We would not be ungrateful to the potato, and could not find it in our hearts to despise it; and if we are about to relinquish it, diseased or not, we could only consent to renounce the root for a better. Cobbett's rash abhorrence of it was political. He did not understand its history; and we may be allowed to say its history, notwithstanding the amusing anecdotes with which it teems, has always been misunderstood. Thus if the Irish adored, and adore it, they had the most undoubted right. Turn to any work of general information that we like, the attempt is constantly made to deprive Ireland of the glory of giving the potato to Europe—on its introduction from "Old Virginny," in 1584, by Sir Walter Raleigh—because the name given it by the Spaniards, "battata," is a corruption of some name given it by the inhabitants of Guito; and because we directly derive our name "potato" from that which was applied to a root grown previously in the gardens of Spain and Portugal. Now this is all erroneous. It was a convolvulus—the Spanish sweet potato—which in the beginning of the sixteenth century was introduced into Spain, and cultivated under the Indian name of battata. Old Gerrard, our famous English herbalist, knew this very well, and sets us all right. In 1590 he describes the potato (convolvulus) roots as "common and ordinary meat among Spaniards, Italians, and many other nations; which," says he, "no doubt are of mightie nourishing parts, and so strengthen and comfort nature; whose nutriment is, as it were, a mean between flesh and fruit, though somewhat windy; but being roasted in the embers, they do lose much of their windiness, especially being eaten sopped in wine. Of these roots may be made conserves, no less toothsome, wholesome, and daintie than of the flesh of quinces; and likewise those comfortable and delicate meates called in shops morcelli, plancentulæ, and divers others such like. These roots may serve as a ground whereon the cunning confectioner or sugar-baker may worke and frame many comfortable and delicate conserves and restortaive sweetmeats.'' Even so. Shakespeare—who, by-the-bye, has been noted as ignoring Raleigh and all his works, and never once mentions tobacco, although Ben Jonson often does—makes Falstaff, in allusion to the sweet convolvulus, say, in the "Merry Wives of Windsor"—

"Let it rain potatoes, and hail kissing comfits;"

and it is evident that the connection of the meteorological phenomena thus invoked would be unintelligible with refer-

ence to our potato; whilst it is obvious enough, from what Gerrard says, that kissing-comfits and all such sweets were made of the Spanish potato. This fact should also be borne in mind where the allusion to potatoes as a love incentive occurs in the other Elizabethan and even later dramatists. As for Raleigh's potato, the story goes that, having planted some sets in his garden at Youghal, the plants flowered duly, and in September produced *apples*, which the disgusted gardener bore to his master, indignantly demanding if these were "the fine American fruit." Raleigh tasted the apples, disrelished them entirely, and impatiently commanded the descendant of our first parent to dig up the weeds and cast them away. The imperious order led to the discovery of nearly a bushel of beautiful tubers, which Raleigh had no difficulty in recognising as the genuine earth-apples, as our French friends very correctly term them. Thus it was that Ireland, by original right, inherited the potato; for from the discoverer's garden at Youghal were the sets distributed over Great Britain. Lancashire, which to this day grows the best potatoes in England, owed them to the fortuitous occurrence of an Irish shipwreck on that part of the coast known as the North Moals; such was the occasion of their introduction into England. Evelyn was urged by the Royal Society to treat of their cultivation in his "Sylva," published under its direction; and it is not a little remarkable, in connection with what we are about to mention respecting the new Chinese potato, the probable successor of the Virginian, that he recommended exactly the course which is not found advantageous in the case of the latter, but is nevertheless indicated as the means of rendering the new root most productive, namely, to leave the parent plants in the same spot of ground from year to year, covered up with litter to shield them from the winter's frost, and only abstracting a few tubers for use in the autumn. Another mistake respecting these early potatoes has given rise to many visionary theories respecting the "disease," and to endless assumptions of their improvement in feculent matter and fibrous degeneracy; whereas it is certain that the original potatoes were very good ones, and that the fact of their sticking to the teeth of the few gourmands who were then privileged to see them on the table, arose from ignorance of the art of cooking them, and from no waxiness of the tuber. The General Report of Scotland (Sir John Sinclair's) mentions that in 1730 a person was invited to taste the first potatoes planted in the county of Forfar. The roots had been merely heated, and adhered to the teeth like glue. Their flavour, as may well be supposed, was at the same time far from pleasant, when precisely in the nick of time, a gentleman who knew better, for he had tasted the potato in Lancashire, arrived upon the scene, and remanding the condemned roots back to the hot turf ashes, had them roasted into that delicious mealy morsel at which the mouth instinctively waters. There is one thing in the history of the old potato which is nevertheless true, and it is, that it took almost two centuries to secure their introduction as a common agricultural crop; but whether the progress of a new and equally or more productive root like the new Chinese potato would be retarded by a similar host of prejudices or apathetic indifference in our present advanced state of agricultural energy, is very problematical. "But," says the celebrated Martin Doyle, "the poverty of the Irish peasantry has done more for the extended culture of the potato than any other circumstance whatever. An article of food on which, nearly exclusively of everything else, many millions of men have multiplied in so extraordinary a degree, and attained proverbial activity and strength of mind and body, cannot be unwholesome or unprofitable; and, though many are of opinion, and with much foundation in truth, that the exclusive use of the potato has injured the condition of Ireland, by calling into existence an overflowing and wretched peasantry, which would otherwise have only been commensurate with the supply of grain, we cannot but think that the introduction of the potato must be considered as a blessing to us, for it will succeed on every soil, in every situation, and in every part of the British Islands, though the amount of the produce and its quality will be considerably influenced by the nature of the soil and local agencies."

Although the calamity which has descended on the heads of these potato-eating millions, by the failure of the root of their dependence, has superadded to this picture a strange phasis of alteration, it would be no product of ordinary pretensions by which we could ever expect to see it superseded. Yet it would be a still greater blessing to Ireland, if a substitute less incident to this alarming casualty could be introduced; for the latest accounts of the 400,000 annual outpourings of the exodus to New York is couched in the prayer of a Transatlantic Hibernian to the *Times*, like that of the French paterfamilias on the increase of his olive branches, "to put a stop to dis," since sickness and destitution threaten their annihilation, even in the land of refuge. Well, the new Chinese potato, or Dioscorea batatas, is alleged to be the substitute required.

This new potato was, several years since, transmitted, along with other useful and promising agricultural plants, by M. de Montigny, who is Consul for France at the Port of Shanghai, in Northern China. The name which he bestowed upon it was that of Dioscorea japonica; but it has been considered by Professor Decaisne, of the Parisian Museum of Natural History (*Jardin des Plantes*), and acknowledged by Professor Lindley and others, in this country, that Dioscorea batatas would not only be a more popular and familiar, but a more appropriate name, seeing that although the plant may in its origin be Japanese, of its cultivation in that dark interior we know literally nothing; whilst its culture in the northern parts of China, and in latitudes assimilated to our own in point of climate, being a fact quite accessible in all its details, ought not to be submerged under the name that associates it with the very exclusive territory of Japan. The plant, or rather tuber, is doubtless a Dioscorea, or yam; and yams in general are tropical productions, exotic in this country, and incapable of being grown without the assistance of a stove. The various species—D. alata, sativa, and aculeata—yield tubers, which in warm countries, are substituted for the potato,* and the order is accused of combining with the farinaceous matter existing in its tubers a prevalent acridity, which is sometimes

* A good many esculent roots, with which we have yet to become familiar, are employed for the same purpose in foreign countries. Thus in Höll's (of Dresden) list of the plants of Madeira, published in Hooker's Journal of Botany, we find one of the Aroideæ (probably the Arum peregrinum, of Buodech) so used, viz., the Caladium nymphæfolium, much cultivated on account of its esculent root. In autumn, the tubers are planted in rows, in a swampy soil, usually near the mountain brooks, in order that the roots may be more sure of moisture. *When the plants are three years old* (exactly like the Dioscorea batatas, when brought to perfection), the tubers are considered good, and dug up: during this time, they always cut off the large leaves, which they make use of as food for swine, so that you never see the inflorescence, and it was only by great entreaty that Höll induced a farmer to permit a single plant to stand and flower for him. The tubers (like the batatas full grown) are frequently the size of a man's head (the batatas being, however, a tap-root, and elongated), of a brownish colour inside (the batatas is pure white), with the taste of a potato when boiled, and are called by the inhabitants "Inhamas."

even purgative. Still a few genera are found in temperate climates. Our black bryony, of the English hedge-rows (Tamus communis), is one, though, to be sure, it is no great bargain; for though its fruit is red and succulent, its root is very acrid. Yet all this is nothing. The Solanum tuberosum, our cultivated potato itself, is, it is well known, quite a poisonous plant in a state of nature. Culture may readily ameliorate all this acridity; and if we can credit all that has been stated in favour of the new importation, has far more than done so. Certain it is that it holds the same place in the North of China, and is found to comprise the same nutritive properties, as the potato in this country. Mr. Henderson, a Devonshire horticulturist, by whom it is introduced amongst us, designates it, in fact, a potato, just because with us ordinary yams cannot be grown except by means of stoves. M. de Montigny has stated that the Chinese, at taking up the crop, set aside all the smaller roots for seed. It is well known that this is a practice now preferred by our market gardeners to cutting large potatoes into sets, simply because they like a juicy set, and find the immature tuber most favourable for their purpose. This is, so far, fortunate in the case of the new potato, admitting, as we shall presently learn, of its rapid and unlimited propagation; for the Chinese place these tubers first in pits or trenches for preservation (and they are said to keep far better than potatoes all the winter, covered with straw and a coating of earth, never losing weight or developing exhaustive shoots); and in spring, being laid out horizontally in beds of prepared mould, they speedily germinate, and send forth long trailing stems, like those of the kidney bean. In six weeks' time the stems attain six feet in length, and are planted out afresh, and layered—that is, the plant is laid lengthwise along a slight furrow, on the top of a ridge, and all except its leaves covered over with earth. Immediately after rain, it begins to take root, or in dry weather is watered until it grows; and in fifteen or twenty days, it produces tubers, throwing out at the same time long trailing stems, which are, however, carefully prevented from taking root, and producing a second set of tubers, to the prejudice of the main crop. Sometimes the shoots are simply pegged down, without removal of the plant, over the sides of the ridge on which it grows, at intervals of six or eight inches, and there striking root, throw out tubers. By this means it is stated that immense quantities of roots, of the size of our early kidney potatoes of the garden frame, are raised on comparatively small pieces of land. To obtain large-sized tubers, small ones, or portions of large, are planted in ridges, at from ten to twelve inches apart; and the plants being allowed to grow freely in autumn, the tubers thus attain an average weight of one pound and upwards. This is the plan which has been pursued at the Museum of France, the only place in Europe where the new plant has hitherto been cultivated. And in the report of M. Pepin on the subject, it is conceived that a few years must yet elapse ere we shall know to what extent the roots left in the ground will acquire weight and bulk, and how long they may remain in the soil without deterioration of their quality; for it is one of their peculiarities that, like the roots of the Jerusalem artichoke, they will remain in the ground several years, acquiring weight, size, and nutriment, instead of deteriorating, and requiring, in fact, little or no cultivation, whilst yielding at all seasons aliment within the reach of every one. A tuber taken up at the end of three years, in France, had its cellular tissue healthy to the centre, where it was neither hard nor woody. A root was also preserved in a cellar from Oct., 1852, to 30th May, 1853, without any development of shoots, unchanged, without loss of weight, and might have been kept so nearly throughout the year, which is not the case with either the common or sweet potato, since they always sprout in spring. Moreover, Decaisne believes this Dioscorea richer in nutrition than, and superior in quality to the potato: its roots are white as snow, having no visible fibre or woody matter within, and, cooked by steam or roasted, look and taste like the best potatoes. This is not their whole culinary advantage, either; for two pieces of tubers, the size of a hen's egg, of Dioscorea and Batate blanche, being put into boiling water simultaneously with a Dutch potato of similar size, were "done" in ten minutes, whilst the Dutchman took twenty.

The strongest point, perhaps, in favour of the new candidate for cultivation is the fact that it will grow best on sandy downs usually considered barren, and may be regarded as a messenger sent by Providence to reclaim our most extensive wastes, in advance of the onward strides of population. It is, indeed, pointed out by its partisans as a probable means of converting waste land to a useful purpose, as well as profit. Neither does it require strong or liquid manure—items expressly forbidden in its culture; but pits filled with earth and a mixture of decayed manure, and treatment similar to that bestowed upon asparagus, are strongly recommended as the means of producing the most abundant crop, the question of the expense of manual labour being asserted to be of little consequence, compared with the remunerative results.

THE HISTORY OF BUTTER.—From the various statements in history, it may be safely concluded that the discovery of butter is attributable neither to the Greeks nor Romans, but that the former were made acquainted with it by the Scythians, Thracians, and Phrygians, and the latter by the people of Germany. It appears, says Beckman, that when they had learned the art of making it, they employed it only as an ointment in their baths, and particularly as a medicine. It is never mentioned by Galen and others as food, though they have spoken of it as applicable to other purposes. No notice is taken of it by Apicius, nor is there anything said in that respect by the authors who treat on agriculture, though they have given accurate information regarding milk, cheese, and oil. This may be easily accounted for by the fact, that the ancients were entirely accustomed to the use of good oil. In like manner, butter is very little employed at the present day in Italy, Spain, Portugal, and the southern parts of France, but is sold in the apothecaries' shops for medicinal purposes. During the ages of paganism butter appears to have been very scarce in Norway; mention is made by historians of a present of butter so large that a man could not carry it, and which was considered a very respectable gift.

PLEASURES OF FARMING.

The sun shines rosy over the hills
On flowers with dew-drops bending;
The carol of birds and the odorous breeze
Together come gratefully blending.

I rise to guide my steady plough,
I drive my horses cheery,
And blithely sing, as I follow along,
Oh, a farmer never is weary.

His toil is sweet, his heart is light,
Few cares with him are dwelling;
He views his flocks in plenty spread—
His corn all ripely swelling.

Swift pass the hours, the evening comes,
My bosom throbs more cheery,
As home I hie, to court and kiss
My own true-hearted Mary.

April 24, 1855. —SKYLARK.

OUR SUPPLIES OF FOOD FOR HORSES, CATTLE, AND SHEEP.

In seasons like the present, every one is driven to the utmost extremity to supply by artificial means a substitute for the natural food of his horses, cattle, and sheep. This can only be done at very considerable expense, and, when effected, falls infinitely short as regards the beneficial result attendant upon the use of ordinary food bountifully supplied in more genial seasons; and it is with the view of drawing attention to this subject that we offer our opinion, rather with a hope to elucidate by correspondence that which we individually feel unable alone to supply.

The months of April and May have always been considered the most difficult portions of the year for obtaining a supply of food for cattle and sheep; and it is only by foresight and judicious cultivation that we can obviate the necessity of becoming dependent upon the uncertainty of seasons. For, at the period to which we are adverting, we must consider that all root-crops, such as turnips both of the Swedish and common varieties, are consumed, and, if not so, have become so much depreciated as to remain of little or no value. We ought therefore to look for a provision from other sources that can be relied upon in such backward seasons as the present; and we suggest that in mangold wurzel we have a root that will to a great extent supply this deficiency. At present, however, it is not extensively cultivated, and what is more astonishing, its value is by many scarcely admitted or appreciated. In giving an opinion, it may therefore be necessary to state that it is based upon an experience of upwards of thirty-five years in its cultivation and application.

The cultivation necessary for its production is so well known, that we do not feel that it is within our province to here dwell upon it; but it may be necessary to state that it may be grown upon every description of soil upon which the Swedish turnip will succeed, and upon heavy clay land also, with decided advantage; that it is more certain in its result in producing a crop, being less subject to attack from insects than the common turnip or any of the Brassica tribe of plants, and, when properly stored, is available at all seasons, especially during severe frosts. As the spring advances, it gradually improves in value, and may be used with more beneficial advantage in May and June than in any preceding portion of the year, for at that period a large proportion of the water it contains will have become evaporated, so that it may be then eaten with impunity by cattle and sheep, without producing a relaxed state of the bowels, to which it has a tendency in an earlier period, if uncombined with dry food, such as cut straw, chaff, &c. In any season it is eaten with avidity by every description of animal, even when turned out into pasture; that no loss need ever take place by having it in superabundant quantity, in seasons when it might otherwise be but little required.

In this root, therefore, we have an adjunct, in a feeding point of view, for the swede and common turnip, and at a season when those roots are not to be had, or have become of little or no value. We therefore contend that every well-managed farm ought to have a supply equal to a consumption of six weeks at least, for all the stock, at the beginning of April, and which might readily be effected with the assistance of a very small portion of farm manure, in conjunction with guano or superphosphate of lime, either in admixture or separately, combined with an equal quantity of fishery-salt.

So far as the application of this root can be beneficially made for feeding cattle, we contend that it is at all times equal to the swede turnip, even at the commencement of the year; but to render it beneficial, it must be sliced, and combined with cut chaff and the other usual substitutes, such as bean or barley-meal, linseed, and linseed-cake, Swede turnips, and more especially cabbages and the leaves of other vegetables, cut up together with the dry food. Independent of this, the leaves, when applied in the same way, are found to be superior to any other vegetable production for milking cows, as several recently-reported experiments, made by persons independently, have shown.

So far, we have explained the general utility of this root for feeding; and we most unequivocally assert that its tendency to produce scour in cattle solely arises by an injudicious application of it, by not combining it during feeding with the substitutes before mentioned, for under no circumstances should it be given to cattle by itself, until late in March, and then only in limited quantity at one time.

But there are also other substitutes for early feeding which we can more or less take advantage of, and by prudent foresight obtain; one of these is Italian ryegrass, which comes earlier for feeding in the spring than any other description of the grasses, and by its quickness of growth may be obtained by sowing upon lands designed for fallow in the ensuing year, either by

sowing it in the spring with the corn crops, or after vetches have been cleared, in the months of June or July. Under such management, abundance of food may be obtained at small cost; and the land may be occupied by the plough, for fallowing, from the middle of May or beginning of June, as circumstances may dictate, and the injurious effects, by this mode of growing it upon land intended for wheat, be thereby obviated.

Rye is also another substitute for early spring feeding; but it is not so productive or beneficial as Italian ryegrass for sheep, whilst it is provided at greater cost. But a variety called the Early Broad-leaved may, on land suitable for its production, be grown with great advantage. This variety has been grown by Mr. Baker, of Writtle, and, by his statement as communicated to the *Journal* of the Royal Agricultural Society, with great advantage; but it requires light sandy or gravelly soils, to enable it to be grown successfully. On this description of land, it is this season producing from four to five tons per acre, and has been in use from the 27th of April till the present time. In general, its produce is from six to ten tons per acre. By the middle of May, it is mown daily, and combined with straw and a small quantity of hay by being cut into chaff, diminishing the latter as the rye advances in growth, may be used even until it has fully eared out. Cattle and horses thrive well upon it; and it thus becomes a substitute, in such seasons as the present, for hay and corn, besides producing an easy and safe transition from hay to green food upon the constitutions of all animals feeding upon it.

THE PROSPECTS OF DEEP CULTURE.

In former articles on tillage, we omitted all special reference to harrows, rollers, and other instruments for comminution, treating only of the general nature of the management pursued under different systems. Having shown how a more perfect superficial stirring and cleansing is gaining favour in practice, let us enquire, further, into the prospects of *deep* culture. No subject (with perhaps the exception of liquid manuring) has lately engaged more discussion than this, and yet its advocates do not urge its adoption in opposition to improvements in shallow working, but as an accompaniment of, or indeed a foundation for them. Ever since the work of under-draining became actively established throughout the length and breadth of Great Britain, since from thus digging into and examining subsoils in order to dry them we naturally proceeded to break and crumble (with the subsoil plough) such as were stiff, and further ventured to trench and plough up to the surface various earths that might mingle with and ameliorate the top soil, the policy of permanently deepening the cultivated staple on suitable soils has been gradually obtaining ground among thinking agriculturists. Do not the deeply-burrowing roots of plants like good nourishment in the subsoil, as well as near the surface? Why not, then, bring up the soil from a depth of a foot or more, and enrich it in the same way that we do the surface? Does not the success of garden culture depend mainly upon the deep fertilizing work of the spade, which improves and strengthens the loose texture of a sand, no less than it mellows a stubborn clay, and in time wears even a stony bottom into mould? Lands there undoubtedly are, upon which deep digging would only "let down" the vegetable nutriment which is with difficulty supplied and maintained in the thin staple; but where a clayey stratum lies beneath, chemical science explains what experience has long taught—that we have only to dismiss our dread of the cold hungry appearance of the mass, lift it into the light of day by prudent instalments, and reap the benefit of its wheat-producing properties. Not that we are to reverse the position of soil and subsoil every time we plough and cultivate; this, from what has been advanced in previous papers, would be unnecessary and fruitless labour; but that *occasionally* a deep ploughing, trenching, or digging should be performed, in order to gain the full powers of production contained in the soil. Few persons doubt the value of such a process for gardens and allotments; indeed, any one who enquires at all, knows that the allottee who lays up deep spits of earth before winter, and forks over at less depth in spring, gets far better returns for his toil than he who only digs a few inches down, or only when he wants to put in the seed. But how can the system be advantageously applied in the field? Well! the best cultivators in Flanders, learning that the influence of the atmosphere upon the ground is of first-rate importance, plough their stubbles immediately after harvest, and plough very deeply, not so deeply *every* year, but once in four or five years. The light soils do not need it; but upon heavy soils, they first plough an ordinary furrow six inches in depth, then this is followed by a strong implement called the "coulter plough," which, drawn by three or four horses, completes a total depth of twelve inches. This practice is reckoned there to exert a favourable influence

upon all crops for five years. Many farmers annually treat their heaviest lands in this way for summer crops. In what is called the Waas country, where the farms are very small, it is a general custom to dig up the ground every five years, to a depth of 20 to 22 inches, and then to grow potatoes, carrots, or oats upon it. For this operation, they make use of spades long enough to accomplish the whole depth at one spit. On light soils, they use spades 12 inches broad, which are of wood, and only at the lower part covered with iron; for heavy soils, spades wholly of iron, and only half as broad, are used. And it is generally thought that the heaviest soils must be stirred the deepest. Such is the account given in *Blackie's Cyclopædia*. Are we yet to learn the art of cultivation from the Flemings? But in England, where land is held in larger occupations, spade-husbandry by manual labour is not commonly looked for—even Mr. Smith, at Lois Weedon, has substituted horse for hand labour, as far as practicable. On the strongest English clays, where the system seems most required, the ploughing of a single furrow is found laborious, and expensive enough, without doubling the task in trench-ploughing. But if we cannot get the full benefit of the soil's fertility by the plough, without an unreasonable expenditure of time and toil, the question arises, *is the plough the only possible implement*, or *the one most adapted to the purpose?* Hitherto it has been the only tool by which horse-power can be effectually applied to break up strong as well as light land; but its injuries inflicted upon the former, in wedging and hardening the subsoil, and its enormous waste of power in friction, have been long perceived. Again, while it may serve pretty well for turning over a shallow furrow, how can it reasonably be fitted for a purpose utterly foreign to its *first intentional use*, and at variance with its very nature? To lift up a heavy mass of soil from a considerable depth seems to demand a vertical action, rather than a mere horizontal draught; so that the implement to perform such an operation should be *derived from the deeply delving spade*, rather than a modification of what was at first intended only to loosen the surface. Such an implement we do not at present possess; some machines there are that will *stir* to a great depth, but cannot completely bury the surface of stubble, sward, or lea, and expose the lowest portions upon the top. We doubt whether such will ever be constructed and *used* until the expected novelty of steam cultivation has become a fact. Perhaps it is an augury of the near approach of this great improvement, that a process of tillage should be now demonstrated by both science and field experience as *true in principle and promising in results*, and yet that we should be *waiting for some better mechanical means of performing it.*

Meanwhile, we are glad to observe that the researches of chemists and the experiments of ingenious cultivators are not being lost sight of, or their applicability in practice altogether deferred in favourable localities. The tendency of all our farm practice is now towards deep tillage; and as far as our personal observation can extend, we should say that stubbles are more commonly ploughed up eight or ten inches deep for fallows, than has been known at any previous period, that is, on lands not so intractile as to strain four stout horses in the turning of a common furrow. However, we must set off against this statement the fact that, in Oxfordshire, and in some other strong land districts, farmers persist in ploughing their clay only four inches deep, though they have four or sometimes five horses to spare for the operation, and though this shallow staple of course suffers extremely from wet and drought. How long are the inexhaustible riches of such a soil to lie unappropriated, when farmers might use the subsoil-plough, and their landlords need only the assistance of Mr. Fowler, to make their lands friable?

THE LAST CATTLE MARKET IN SMITHFIELD.

The period of Smithfield's existence as a fat stock market expired on Monday, June 11. As the site of the metropolitan cattle market, "its glass is run." Early in the morning all was bustle and activity, the noisy concourse being as healthy and full of life as usual; but before night the curtain drops—the market area is swept clean by the scavenger's besom, and all that was ever said or done here becomes matter of history. Throughout the day fat stock exhibited their usual characteristic indifference to past and future; but to the trade—some of whom have weekly attended here for nearly the past half century, and who have to look forward to many a market day to come—"the finger of Time" was obviously pointing, all day long, to the closing scene as one of no ordinary interest; while now that it is past, associations, public and private, fill the mind, acknowledging Smithfield Market as without its parallel in the annals of fat stock commerce.

Smithfield has been a cattle market from time immemorial—held by the Corporation of London by prescription confirmed by various charters since that of Edward III., in 1327. The name itself is traced to two deriva-

tions: first, Smith's Field"—*i. e.*, a field of one of the citizens of this name, from whom the Corporation or magistrates had purchased it for the purpose of holding the weekly cattle market of the capital, thus indirectly proving that the market had originally been held, in accordance with Saxon custom, within the city, and that it had been removed outside the walls to this field when the traffic inside demanded such a step; the second, "Smoothfield," a derivation not so easily reconciled with Saxon usage and the early history of London, unless we suppose that the inhabitants had kept a bowling-green contiguous to the city gate for the amusement of youth; that in those simple times it had been called "Smoothfield," and that when the area within the walls became too densely populated for a cattle market being held it was removed to this place. But whichever of these is right, the date obviously leads us back to a period of tradition.

From the twelfth to the seventeenth century, both inclusive, its importance as a cattle market was all but eclipsed by the more stirring and tragical scenes which were acted upon it. At the latter, our limits will hardly allow us to glance. During this long period it was not only used as a place of execution for criminals of all grades, but for almost every public meeting of the capital. Here, for example, the robber and murderer justly expiated their crimes; here many of our forefathers suffered martyrdom at the stake, purchasing with their lives the truth of our Protestant religion; and here patriots were tortured with all the savage barbarity of an arbitrary and despotic government worse than that of modern Russia. Here an enslaved populace again threatened to plant the standard of rebellion in defiance of Richard and his barons; and here also jousts and tournaments were held with a degree of splendour which no language can describe—fair ladies, in masquerading dresses, leading with silver-gilt chains the princely caparisoned coursers of England's chivalrous knights in dazzling armour to Smithfield, where Spanish and Armenian princes and diplomatists importunately prayed for their assistance "against infidels and pagans" (meaning the Turks, for whom England now sheds her blood!); and here—last, not least—Bartholomew Fair was held, where the whole commercial wealth of the British capital and kingdom was displayed, with that of many a foreign state, accompanied with an amount of legerdemain, gaming, and theatrical performances of which modern times can form no conception. Besides the weekly sale of horses, oxen, sheep, pigs, and poultry, such an addition as we have just hastily cast our eye across must have given to Smithfield during this period a very imposing and important character.

As a cattle market, however, it has during this period, and long before it, occupied a very prominent place. There is no want of historical evidence in corroboration of this; for Fitzstephens, writing in the twelfth century, gives a graphic account of it, especially of the horse market. At that time there were none of those large horse bazaars, repositories, &c., which are now to be met with in every part of the capital, where all our best horses are sold; for then princely knight and citizen attended Smithfield personally, giving to the market all that well-ordered regulation, splendour, and dignity which their presence in those simple times never failed to secure. "It was a pleasant sight," says the above writer, "to behold the nags, well fleshed, sleek, and shining delightfully, walking on either side up and down together by turns, or else trotting horses, which were more convenient for men that bore arms." "In another part," he adds, "stand the country people, with cattle and commodities of the field, large swine, and kine with their udders strutting out, fair-bodied oxen and the woolly flock. There are also cart-horses fit for the dray, or the plough, or the chariot; and some mares big with foal, together with others that have their wanton colts following them close at their side." Such was Smithfield in the twelfth century.

At this time the system of fattening stock and the domestic economy of Londoners exercised a peculiar influence upon the character of the market. Salted meat, for instance, was generally consumed during the winter season, citizens purchasing and salting in November and December according to their circumstances, cattle being generally grass-fed. With the progress of agriculture, including the winter-fattening of stock and the growth of the capital, however, its domestic economy and commerce of cattle underwent corresponding changes; for at the close of the seventeenth century, or in 1698, according to Stowe, "70,000 head of neat cattle, oxen, and cows were annually sold in Smithfield, 540,000 sheep and lambs, 200,000 calves, and 250,000 hogs and pigs," so that the market must have been more than agreeably crowded; but the change to winter-fattening would lessen the pressure of autumn sales, distributing the whole more equally throughout the year. So far, therefore, the old plan of salted provisions became subject to the progress of things, harmonising at the same time with the limited area of the market.

The most important results of this progression, however, and those most deserving of our notice, were the effecting of sales by commission, or the appointment of salesmen; the establishment of the Smithfield banking system; and the removal of our best description of horses from Smithfield to private bazaars in various parts of the capital—results which we shall find strictly in accordance with the subdivision of labour so successfully introduced during this time in almost every other branch of industry.

The appointment of salesmen was the result of experience, graziers finding, under improved agriculture, and the growth of the capital, with its increasing stock of butchers, that it was better for them not only to pay the small commission of the salesman, rather than leave their farms, but also that, from his acquaintance with the metropolis and connexion with the trade, he could procure the best price. At first, the work was one of individual experiment—the only sure plan for basing any system on a sure foundation; and from individual successes a general practice soon arose, and has ever since continued, giving general satisfaction.

It was the successful working of this commission

system, again, which gave rise to another subdivision of labour—that of the "Money-takers." When graziers sold their own stock, they endeavoured to effect the sale of as large lots as possible at one time, selling those not ready afterwards to drovers. In short, where they had any distance to go, they made as few visits to Smithfield as possible; but when they consigned to salesmen, their interest was quite the reverse, for then a different class of drovers arose, who took up stock to the capital at so much per head, commencing at a certain point weekly, and collecting as they approached the capital; consequently, they were induced to send small consignations at short intervals, according as they were ready. This, it will readily be observed, increased the labours of the salesman in collecting money, as he had frequently to take the price of one grazier's lot when he ought to have been selling another; and as lots were often divided among different butchers, the task became involved in inextricable difficulties. Necessity, under such circumstances, soon suggested the propriety of giving a commission to a competent party for receiving and answering invoices, collecting the money from butchers, and for remitting it to graziers. Hence the origin of the Smithfield banking system.

The removal of the best description of horses from Smithfield, again, was effected by a combination of causes—subdivision of labour, and improved management, both being involved. In this case, sales were not only effected by commission, instead of by the seller himself; but the whole routine of management, including the effecting of sales in our bazaars, is so totally different from that of Smithfield, as to suggest the idea that it belongs to a different age of civilisation. The work too, appears to have arisen from small beginnings, founded on experiment, like the work of sales by commission in the cattle trade, and to have grown to its present greatness, individual enterprise leaving behind it, as is generally the case, the less industrious fabric of a public market. As soon, for example, as it was discovered that Smithfield did not afford the proper accommodation for fine horses, a bazaar was erected, and sales effected there. The project was immediately recognised to be an improvement, and consequently was supported by those who had good horses to sell, and who wanted such to buy, and at present neither would condescend to do business in Smithfield, even on the score of etiquette alone, so antiquated has its treatment of horses become.

From the increasing growth of the capital, the want of space in Smithfield became more and more severely felt during the 18th century, until towards its close it appears to have been doomed in the public mind as unfit any longer for holding the metropolitan cattle market. Accordingly, between 1802 and 1835, the Corporation made no fewer than eleven applications to Parliament to have it enlarged, and two to have it removed, but without success. "Blue book" after blue book now appeared, presenting an amount of conflicting evidence, the most anomalous perhaps that ever emanated from Parliament, until August 1st, 1851, when "The Metropolitan Market Act" (14 and 15 Vict., cap. 61) was passed, which finally settled the affair. Prior to this, or in 1833, the Islington speculation fell to the ground from grasping at too much under antiquated means. Had private enterprise started a cattle bazaar, to accommodate the best description of fat stock, for example, when horse bazaars were erected, and pursued a similar course of rising from small but successful beginnings to large, our first-class butchers by this time might have looked upon the dub and dirt and water-proof habiliments of Smithfield as being as far below their dignity as do our first-class purchasers of horses; but the working of Islington never had a practical foot to stand upon, and therefore could not but fall as it did. Subsequent to 1833, the area of the market was increased from 4 acres 2 roods and 35 poles, to 6 acres and 15 poles, at an expense of £43,000 to the corporation; but this increase fell far short of that of the population, so that the expenditure was a prodigal waste of money.

The amount of business done in Smithfield, in 1848, was thus given by Deputy Hicks, in his evidence before Parliament, 1849: —

	£	s.	d.		£
240,000 horned cattle.....	18	10	0	each —	4,144,000
1,550,000 sheep	1	18	0	„ —	2,945,000
27,300 calves.....	3	15	0	„ —	102,375
40,000 pigs	1	10	0	„ —	60,000
					£7,251,375

On comparing this with that given by Stowe, above, it will be seen that our consumption of veal and pork is greatly less than it was at the close of the seventeeth century, especially when we look at the populations of the two periods standing in juxta-position. Thus :—

	1698. (population, 674,000.)	1818. (population, 2,172,386.)
Calves....	200,000	27,300
Pigs	250,000	40,000

We cannot conclude this notice without paying a tribute of commendation to Mr. Shanks, the clerk of the market, whose labours during the long period of his office have given very general satisfaction. The order which he has preserved in the management of the old market, with everything against him, may be taken as a guarantee of the successful opening and government of the new.

STANDARD WEIGHT OF GRAINS IN CANADA.—The following table shows the weight of a bushel of the different grains, &c., as fixed by a recent enactment of the Canadian Parliament :—

Wheat.....	60 pounds.
Indian Corn.....	56 „
Rye.....	56 „
Peas.....	60 „
Barley.....	48 „
Oats.....	34 „
Beans	60 „
Clover Seed.....	60 „
Timothy Seed.....	48 „
Buckwheat	48 „

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

MEETING AT TIVERTON, JUNE 13.

Acting upon that peripatetic principle now becoming so general, and which has mainly tended to restore the fortunes of "the Bath and West of England," the exhibition of this year was held, on Wednesday, Thursday, and Friday, at the town of Tiverton. It would be difficult to quarrel with the selection. Situated very centrally for most of the local supporters of the Society, it offered all the facilities of railway accommodation to those who reached it from more distant quarters. This latter recommendation, indeed, might have tended, if anything could, to cause the Council to hesitate in the choice they ultimately determined on. The West of England is now something far beyond a merely local show. As one of the speakers said at the dinner, "it is fast growing into another Royal Agricultural." It thus becomes necessary to consider in some measure the capabilities of any proposed site to meet the calls which will be made upon it. Still it must be remembered that, although so strongly supported by exhibitors and visitors, the Association has but a limited area to range over; and, at worst, with a few "outlying deer," as was the case in the present instance, there can be no great deal to complain of. Tiverton, to be sure, was fairly eaten out of house and home on Thursday; but, then, we believe the reality altogether exceeded any previous expectations as to who and what was coming.

Thursday, in fact, like the Cup Day at Ascot, with which it clashed, was the one grand day of the week. Fortunately, it was fine, and crowds continued to pour in upon the place in an unceasing stream. As with the town, the railway would scarcely seem to have reckoned on so great an amount of custom; this, with but a single set of rails from the main line, led at times to some very tedious delays. The junction station, indeed, enjoyed the rare merit of never being "cleared;" while, coming and going, passengers had ample opportunity for noting how admirably observed was the very palpable maxim of the officials, "that, if it were done at all, it were well it were done slowly." The holiday visitors, however, showed most praiseworthy patience, and stood shunting and backing, and so on, for an hour together, with no visible loss of temper or enjoyment. Matters here certainly might have been much better managed.

As at most meetings of any importance, the business commenced with the opening of the week, and Monday and Tuesday were occupied as usual in testing some of the chief entries in the implement department. Amongst the more prominent of these, were the trials of the reaping machines, steam-engines, and light and deep ploughs. In the first of these, Dray's Hussey had but one competitor, in a local maker, Mr. Bowhay, of Modbury, whose invention, though not equal in its delivery, especially, to the prize machine it had to contend with, was still considered well deserving the second premium of the Society. In the portable engines, Hornsby once more stood first, with Messrs. Tuxford as a good second; while, rather singularly, the prize for the best light plough was again divided—as at Lincoln, last year—between Messrs. Ransome and Howard. Considering there was little or no novelty in this department of the exhibition, we may well leave the prize-list to tell its own tale. The catalogue, however, shows that this section of the show is still increasing in both numerical strength and real merit. It was beyond all doubt, on this occasion, the chief attraction of the meeting; while the satisfactory results it is tending to are manifested in two very striking facts. In the first place, almost all our chief implement makers who have once exhibited at the annual gatherings of the West of England Society still continue to do so. We found here, again, the stalls of Ransome and Sims, from Ipswich; the Howards', from Bedford; Hornsby, from Grantham; Tuxford, from Boston; Barrett, Exall, and Andrews, from Reading; Busby, from Yorkshire; Dray, from London; Coleman, from Chelmsford; Fowler, from Bristol; Holmes, from Norwich; Smith and Ashby, from Stamford; Cambridge, from Bristol; Turner, from Ipswich; and others from a distance. Their presence is a direct compliment, both to the management of the Society and the agriculturists of the country. It proves that they are satisfied with the treatment they receive from the one class, and the business they do with the other. Still they by no means monopolize the latter. Year after year are the more local exhibitors of implements on the increase. They receive, too, their fair share of favour; while some, as in the case of Mr. Bowhay, come with great credit through the most ambitious trials. From what we have seen, we know there are several gentlemen on the Direction who take infinite pains in

arranging and doing every justice to this portion of the yard; and we are happy to see their efforts followed in every way by such convincing proof of the advantage of their labours.

We believe it to be from no fault, as from no mistake on the part of the Council, that the show of stock was not this year as proportionately upon the advance, if, even, not equal to what it has been. The show of animals at a West Country Meeting must of course depend in a great degree upon the entries of Devon cattle. These unquestionably fell short in some classes, both as regards numbers and excellence, to what we have seen. The cause of this default is worthy of some little consideration. It seems that one or two famous breeders of the North Devons have met with all that success they deserved. They have sold their stock not only to near neighbours, but to other admirers of them farther afield. The agriculturists of Somersetshire have especially taken to this breed of cattle, which they now venture to exhibit in a laudable spirit of enterprise against the original founders or improvers of the sort. One very natural consequence of removing a well-doing beast from a poor soil to a good one, is that he grows to a greater size. This has been the case with the Devon cattle. There is a great deal more in a beast from the Bridgewater than in his relatives from the Exeter or Molton districts. Now it is a common saying, that "a good *big* horse is better than a good *little* one;" and many judges of cattle would seem to lean to the same opinion. The Devon breeders, however, will not admit that size or quantity is any recommendation at all. Let quality and symmetry be points if you please, but let the capability to make more beef have nothing to do with it. The Devon men, or one or two of them at least, we are told, held out for this. They would not consent to exhibit unless they were assured that the judges appointed would be entirely of their own mind! The Council of the West of England Society very properly, as we think, refused to admit of any such dictation, and the consequence is, these gentlemen declined to enter. We hope they may still be brought to see how entirely mistaken they are in the course they have adopted. Is the animal sent from Somersetshire really a pure-bred Devon? If not, let them object to him. If he is, how can they refuse to meet him? As well might the Duke of Richmond or Sir John Shelley refuse to recognise Mr. Jonas Webb's as Southdown sheep, because they grew bigger on the flats of Cambridge than they do on the downs of Sussex.

It must not be assumed, however, that the Tiverton Show was entirely wanting in becoming specimens of that very beautiful beast—the Devon. In one or two classes, on the contrary, there were some very good—amongst the heifers, more particularly the two and three-year-old entry, being generally commended. As a rule, the cows were altogether superior to the bulls; while to prove how a principle may be fairly carried out, we may cite the first prize animal of either sex. Mr. James Davy's, the best bull, was in really beautiful condition; the same may be said more decidedly of Mr. Halse's first prize cow. They had, of course, to oppose some much higher-fed animals, but whose merits for "improving our breed of cattle" were hardly in the same ratio. And yet, it is urged this wholesome restriction cannot be maintained. Surely, with a good and upright judge, mere flesh, like charity, however well intended, can never "cover a multitude of sins."

The other classes of cattle—for Shorthorns, Herefords, or any other pure breed—again, consisted entirely of Shorthorns, there not being a Hereford in the yard. Here, too, the preference was all with the ladies, the most perfect animal of any kind in the show being Mr. Stratton's prize cow Matchless 2nd, by Red Duke, out of Moss Rose. She was very deservedly as generally admired, and will no doubt, as was the case last year, find her way to further honours. A white bull, bred on both sides from Mr. Stratton's herd, also took the first prize in the first class of bulls; while he himself, it will be found, took almost everything else he entered for. Although the number of animals here, again, was not large, there were some well-bred ones amongst them, with the stamp of the "Herd Book" figure in their pedigrees. The second prize bull, the property of the Rev. G. Smith, and bred by Colonel Kingscote, is a son of the Fourth Duke of Oxford. As with the Devons, "the trio of cows" in this class was a failure.

In sheep, the superiority was with the Leicesters and Cotswolds; a large entry of the former, and a small, but very good one of the latter. Mr. Sandy, we are told, was agreeably surprised with the show of Leicester rams; while the late Lord de Mauley's Cotswold ewes were considered as amongst the best of this sort ever shown. It is a variety evidently rising in repute, although the competition on this occasion was still further reduced by the disqualification of several sheep sent; they were unfairly shorn, and at once condemned as such by the judges. It will be observed from the list that the Society was fortunate enough to obtain some of the best men from all quarters to undertake these trying duties; though we question whether Mr. Rigden was as well satisfied with the Southdowns as Mr. Sandy with the Leicesters. The Hampshire-downs, too, were not in

the force they were at Bath, although there were, as there always is, some very useful sheep amongst them. The horned Dorsets were also well represented; and considering that the Southdowns were a manifest improvement upon what we saw last year, this section of the show may be recorded as very successful. It is said the Tiverton flockmasters sadly want some new blood; and we have only to trust they profited by what they saw on this occasion.

A very good show of pigs, and a very bad one of horses, complete the live-stock catalogue. In the former, the Berkshire had all the best of it in the large classes—backed by a very excellent cross, so far, at least, between this breed and the Neapolitan, exhibited by the Reverend Mr. James. The small classes were chiefly confined to the black Essex and Leicesters, both in some fashion here, and the Leicesters still in a majority. What with good feeding or breeding, or both, the line between some of these and the larger sorts is but a fine one.

The great want of all these shows has been that of horse-power. With the exception of Mr. Bailey's two-year-old cart-colt, we remember little to commend. The first prize cart-mare was certainly a big, weighty animal, but hardly giving one the ideal of the true Suffolk Punch. Sir Thomas Ackland kindly sent three or four Exmoor ponies, which were exhibited as extra stock, and fairly surpassed by the Welsh ponies shown with them. We are told, though, there is some better sort of the Exmoors, which we should like to have seen. Would not a society, embracing the range this does, be justified in offering a premium or two for moor or mountain ponies?

A Poultry show, at length included all in one charge, a capital band, and the dinner tent all within the exhibition-field, served to perfect the attractions of the grand day. The effect of thus having the dinner laid in immediate proximity with the exhibition was evident enough. The attendance was very full, and the proceedings, under the direction of the President, Lord Fortescue, went off as pleasantly as could be. As is but too often the case, however, the agricultural topic was made merely subsidiary, and we have accordingly little to report. A very good suggestion from one of the judges—Mr. Caldwell—for facilitating the trials of the steam-engines, is henceforth to be adopted: another from Lord Ebrington is, we fear, scarcely likely to meet with as much success. His Lordship proposes "to offer for three years a sum of £20 in the shape of one prize, or distributed, as should be determined, to the sons of the yeomanry of Devonshire, between the ages of 18 and 25, just entering on life, upon obtaining a certificate of competency in scriptural knowledge, and who should pass the best examination in that acquirement which no Englishman, in the middle class, should be without; also in the English language—that glorious language which they had received from their fathers—and in the Geography and History of the British Empire, and in practical mathematics. And he was happy to announce that he had produced the kind assistance of three gentlemen who had consented to aid him, namely, the Rev. Chancellor Martin, Sir Stafford Northcote, and R. Dymond, Esq., and who had promised to conduct the examination for him (the noble lord) in his absence, and to go carefully through the candidates' papers, also making *viva voce* examinations of each candidate, and arranging them in classes, and placing every individual as at Cambridge, according to the manner in which he had answered at his examination."

This is no doubt well meant, but we can say little more for it, and we question whether the West Country Society will do much by taking it up. To us it reads in the highest degree ill-considered and impractical. We trust that agriculturists are all now becoming alive to the advantages of a good education for their children; but we cannot think my Lord Ebrington's twenty pounds will ever have much to do with it.

It has been a source of pleasure to us to watch the certain advance of the West of England Society. It is with sincere gratification that we can report the hold it now has on all classes, and the good it is achieving. Beyond this, we have even a personal feeling, when we know that such suggestions as we have considered it a duty to offer have been received and acted on in that spirit we gave them. If we gathered one from our experience of the past meeting, it would be to lower the five shillings charged for the first day. The effect here was to render it comparatively a *dies non*. The privilege or weekly ticket is just what is wanted by a certain class, who take more particular interest in what is going on. The high-priced ticket for one day will keep many back who might come twice at half the price. Tiverton was really but a one-day's show; and suppose that one had been a wet day?

It is not within our province to dwell on the fancy fairs, evergreen arches, transplanted trees, and many-coloured welcomes so characteristic of the West. Sufficient be it to add, that here they all were in full flourish. Beyond this, however, we may give a word of thanks to those gentlemen who labour so earnestly and disinterestedly in perfecting these meetings. There are many with such a claim; while we may especially mention Mr. Ackland, and his brother Mr. Troyte, Mr. Pitman, Mr. Gray, Mr. Robert Smith, Mr. Gordon, Mr. Rendle, Mr. Widdicombe, and Mr.

Maule. The Society owes much to their well-directed exertions.

JUDGES:

For Devons and Horses.—Mr. S. Umbers, Wappenbury, Leamington, Warwick; Mr. S. Tresawna, Lamellyn, Probus, Cornwall; Mr. Thomas Oatway, Marsh Dunster, Somerset.

For Long-woolled Sheep and Pigs.—Mr. Samuel Druce, Eynsham, Oxfordshire; Mr. William Sanday, Holme Pierrepoint, Notts; Mr. Henry Trethewy, Grampound, Cornwall.

For Short-horns, Short-woolled Sheep, Somerset, Dorset, and Mountain Sheep.—Mr. George Brown, Avebury, Marlborough, Wilts; Mr. William Rigden, Hove, Brighton; Mr. Richard Doble, Bartilever Probus, Cornwall.

For Implements in the Yard.—Mr. J. H. Nalder, Alvescott, Lechdale; Mr. J. J. Rowley, Rawthorne, Chesterfield.

For Implements in the Field.—Mr. Joseph Druce, Eynsham, Oxford; Mr. Stephen Smith, Ferne Farm, Salisbury; Mr. Caldwell, Helborowe Hall, Brandon, Norfolk.

AWARD OF THE JUDGES.

DEVONS.

For the best bull, above two and not exceeding three years old on 1st September, 1854, Mr. James Davy, Flitton Barton, Northmolton, first prize £12; second ditto, James Wentworth Buller, Esq., Downes, Crediton, £5.

For the best bull, not exceeding two years old on 1st September, 1854, Mr. John Bodley, Stockley Pomeroy, Crediton, first prize, £12; second ditto, James Wentworth Buller, Esq., Downes, Crediton, £5. Commended, Mr. James Davy, Flitton Barton, Northmolton.

For the best bull not exceeding twelvemonths old on 1st September, 1854, Mr. John Bodley, Stockley Pomeroy, Crediton, first prize, £5; second ditto, Mr. Walter Farthing, Stowey Court, Bridgewater, £3.

For the best cow in calf or in milk, having had a calf within six months next preceding the first day of the exhibition, Mr. John C. Halse, Molland, Southmolton, first prize, £8; second ditto, Mr. Walter Farthing, Stowey Court, Bridgewater, £4. Commended, Rev. C. Smith, Taunton; Mr. John Bodley, Stockley Pomeroy.

For the best heifer, in milk or in calf, above two and not exceeding three years old on the first day of exhibition, Mr. Walter Farthing, Stowey Court, Bridgewater, first prize, £8; second ditto, Mr. Thomas Webber, Halberton Court, Tiverton, £4. Highly commended, Mr. James Davy, Flitton Barton.

For the best pair of heifers, not exceeding twelve months old on 1st September, 1854, belonging to the same owner, Mr. Thomas Webber, Halberton Court, Tiverton, first prize, £5; second ditto, James Wentworth Buller, Esq., Downes, Crediton, £3.

For the three best cows (owner's own breed) in calf, or in milk, having had a calf within six months next preceding the first day of the exhibition, Mr. Thomas Webber, Halberton Court, Tiverton, first prize, £10.

SHORT HORNS, HEREFORDS, OR CATTLE OF ANY OTHER PURE BREED.

For the best bull, above two, and not exceeding three years old on 1st September, 1854, Mr. W. Widdicombe, Hay Ugborough, first prize, £12; second ditto; rev. G. T. Smith, Uffculme, £5. Commended, the Hon. P. Pleydell Bouverie, Brymore, Bridgewater.

For the best bull, not exceeding twelvemonths old on 1st September, 1854, Mr. Richard Stratton, Broad Hinton, first prize, £5; second ditto, Charles Hardcastle Abbot, Esq., Long Ashtown, £3.

For the best cow in calf, or in milk, having had a calf within six months preceding the first day of exhibition, Mr. Richard Stratton, Broad Hinton, first prize £8; second ditto, Mr. W. P. L. Buckle, Clevedon, Bristol, £4.

For the best heifer, in milk or calf, above two and not exceeding three years old on the first day of exhibition, Mr. Richard Stratton, Broad Hinton, first prize, £8; second ditto, Mr. Richard Stratton, Broad Hinton, £4.

For the best pair of heifers, not exceeding twelve months old on 1st September, 1854, belonging to the same owner, first prize, £5; second ditto, Mr. Edward Bowley, Siddington House, Cirencester, £3.

SHEEP.

LEICESTER, or LONG WOOLLED.

(Not qualified to compete as Cotswold).

For the best yearling ram, Mr. John Palmer, Court Barton, Newton St. Cyres, first prize, £5; second ditto, Mr. J. Bodley, Stockley Pomeroy, £3. Commended, Mr. T. Kingdon, Bramford Speke; Mr. John Palmer, Newton St. Cyres; Mr. John Salter, Collumpton.

For the best ram, not exceeding three years old on the 1st January, 1855, Mr. Thomas Potter, Yellowford, Thorverton, first prize, £5; second ditto, Mr. J. Bodley, Stockley Pomeroy, £3. Commended, Mr. Thomas Potter, Thorverton; Mr. John Bodley, Crediton.

For the best pen of five ewes, of the same flock, Mr. Thos. Potter, Yellowford, Thorverton, first prize, £5; second ditto, Mr. James Burston Corner, Longforth Farm, Wellington, £3.

For the best pen of five two-teeth ewes, Mr. J. Salter, Peverstone, Cullompton, first prize, £5; second ditto, James Wentworth Buller, Esq., Downs, Crediton, £3.

COTSWOLD.

For the best yearling ram, Right Hon. Lord De Mauley, Hatherope Castle, first prize, £5; second ditto ditto, £3. Commended, Right Hon. Lord De Mauley.

For the best pen of five two-teeth ewes, Right Hon. Lord De Mauley, prize £5.

SOUTHDOWNS.

For the best yearling ram, prize £5; second ditto, £3. For the best ram, not exceeding 3 years old on 1st January, 1855, prize £5, and second ditto, £3—all taken by Mr. J. Moore, Littlecott, Pewsey. Commended, Mr. John Moore, Pewsey.

For the best pen of five ewes, of the same flock, Sir John Kennaway, Bart., Escott, Ottery St. Mary, first prize, £5; second ditto, Mr. J. Moore, Littlecott, Pewsey, £3.

For the best pen of five two-teeth ewes, Sir John Kennaway, Bart., Escott, Ottery St. Mary, first prize, £5; second ditto, Sir John Kennaway, Bart., Escott, Ottery St. Mary, £3. Commended, Mr. John Risdon, Manor Farm, Taunton.

HAMPSHIRE DOWNS.

For the best yearling ram, Mr. J. Risdon, Manor Farm, Taunton, first prize, £3 10s.; second ditto, Mr. J. Moore, Littlecott, Pewsey, £1 10s.

For the best ram, not exceeding 3 years old on 1st Jan., 1855, first prize, £1 10s., second ditto, £1 10s., Mr. J. Moore, Littlecott, Pewsey.

For the best pen of five ewes, of the same flock, Mr. John Risdon, Manor Farm, Fitzhead, Taunton, first prize, £3 10s.; second ditto, Mr. Edmund Olding, Ratfin, Amesbury, £1 10s.

For the best pen of five two-teeth ewes, Mr. Edmund Olding, Ratfin, Amesbury, first prize, £3 10s.; second ditto, Mr. J. Moore, Littlecott, Pewsey, £1 10s.

SOMERSET AND DORSET HORNS.

For the best yearling ram, Mr. T. Danger, Huntstill, Bridgwater, first prize, £5; second ditto, Mr. George Coombe, Taunton, £3.

For the best ram, not exceeding 3 years old on 1st Dec., 1854, Mr. George Coombe, Taunton, first prize, £5; second ditto, Mr. T. Danger, Huntstill, Bridgwater, £3. Commended, Mr. T. Danger, Bridgwater; Mr. George Coombe, Taunton.

For the best pen of five ewes, of the same flock, first prize, £5, and second ditto, £3, Mr. George Coombe, Taunton. Commended, Mr. Robt. Templeman, North Perrott.

For the best pen of five two-teeth ewes, Mr. T. Danger, Huntstill, Bridgwater, first prize, £5; second ditto, Mr. Geo. Coombe, Taunton. Commended, Mr. Robt. Templeman, North Perrott.

MOUNTAIN SHEEP.

For the best ram, not exceeding 3 years old on 1st Jan., 1855, Sir T. D. Acland, Bart., M.P., Killerton, first prize, £4.

For the best pen of five ewes, of any age, first prize, £4; second ditto, £2, Sir T. D. Acland, Bart, M.P., Killerton.

PIGS.

LARGE BREED.

For the best boar, not exceeding two years old on the 1st of January, 1855, Mr. Edward Bowley, Siddington House, Cirencester, first prize £4; second ditto, Mr. William Hewer, Sevenhampton, near Highworth, £2.

For the best breeding sow, Mr. William Hewer, first prize £4; second ditto, Rev. C. T. James, Ermington, Ivy Bridge, £2. Commended, Mr. J. K. Tombs, Langford Lechlade, and Mr. Wm. Peek, Luccombe, Minehead.

For the best pen of three breeding sows, not exceeding eight months of age on the first day of exhibition, Rev. C. T. James, Ermington, Ivy Bridge, first prize £3; second ditto, Mr. William Hewer, Sevenhamptom, near Highworth, £1. Commended, Mr. Hewer.

SMALL BREED.

For the best boar, not exceeding two years old on the 1st of January, 1855, Rev. Grenville Frodsham Hodson, North Petherton, first prize £4; second ditto, Mr. John Bartlett, Lifton, £2. Commended, Mr. Wm. Leverton, Beaford, and Rev. G. F. Hodson, North Petherton.

For the best breeding sow, Mr. Wm. Northey, Lake Farm, Lifton, first prize £4; second ditto, Rev. Grenville F. Hodson, North Petherton, £2. Highly Commended, Mr. John Bartlett, Lifton.

For the best pen of three breeding sows, not exceeding eight months of age on the first day of exhibition, Mr. John Risdon Manor Farm, Taunton, first prize £2; second ditto, Mr. J., Tanner Davy, Ashtown, Southmolton, £1.

HORSES.

For the best mare in foal, or with a foal by her side, Messrs. Fox Brothers and Co., Tonedale, Wellington, first prize £10; second ditto, Mr. Thomas Merson, West Pitt, near Tiverton, £5.

For the best two years old cart colt (entire) for agricultural purposes, Mr. Henry Bailey, Walgaston Farm, Berkley, first prize £10; second ditto, Mr. John Drew, Parker's-fields Farm, North Petherton, £5.

For the best yearling colt or filly for riding purposes, Rev. H. Mowbray Northcote, Monk Okehampton, first prize £5; second ditto, Mr. Wm. Norris, Loxbear Barton, Tiverton, £3.

AGRICULTURAL IMPLEMENTS.

For the best plough, for deep ploughing, Ransomes and Sims, Ipswich, £3. Highly commended, John Eddy, Kennford; W. Busby, Newton-le-Willows. Commended, F. and J. Howard, Bedford.

For the best plough, for general purposes, between F. and J. Howard, Bedford, and Ransomes and Sims, Ipswich, £3. Highly commended, W. Busby, Newton-le-Willows. Commended, John Eddy, Kennford.

For the best paring plough, to be worked by two horses, James and John Vanstone, Buckland Filleigh, £3. Commended, Wright.

For the best subsoil plough, to be worked by not exceeding three horses, Ransomes and Sims, Ipswich, £3. Commended, Dray and Co., Swan-lane, London; Comins.

For the best turnwrest plough, John Eddy, Kennford, Exeter, £2. Commended, Ransomes and Sims, Ipswich.

For the best cultivator, grubber, and scarifier (wide), Richard Coleman, Chelmsford, £3.

For the best cultivator, grubber, and scarifier (narrow), Richard Coleman, Chelmsford, £2.

For the best heavy drags, F. and J. Howard, Bedford, £2. Commended, Comins.

For the best heavy harrow, F. and J. Howard, Bedford, £2. Commended, Fowler and Fry, Bristol; Coleman, Chelmsford.

For the best light harrow, F. and J. Howard, Bedford, £2. Commended, Comins.

For the best roller, Wightman and Dening, Chard, £2. Cockey and Co., Frome, a special award of £1.

For the best clod crusher or clod presser, John Palmer, Stockton-on-Tees, £2. Commended, Cockey and Co., Frome.

For the best corn drill, Hornsby and Sons, Grantham, first prize, £5; second ditto, John Cheek, Halse, Taunton, £2. Commended, Smith and Son.

For the best corn drill, for small occupations in hilly districts, Hornsby and Sons, Grantham, first prize, £5; second ditto, Holmes and Sons, Norwich, £2.

For the best turnip and mangold wurzel drill, for ridge or flat depositing manure with the seed, Hornsby and Sons, Grantham, first prize, £5; second ditto, Holmes and Son Norwich, £2.

For the best and most economical small occupation seed and manure drill, for flat or ridge work, Hornsby and Sons, Grantham, first prize, £5; second ditto, Holmes and Sons, Norwich. Commended, Mr. Bowhay.

For the best seed distributor worked by hand, Fowler and Fry, Bristol, £2.

For the best general manure distributor, Thomas Chambers, jun., Colkirk, Fakenham, first prize, £5; second ditto, J. L. Bowhay, Modbury, £2.

For the best horse hoe for green crops on the ridge, W. Busby, Newton-le-Willows, £2. Highly commended, Hugh Carson; F. and J. Howard, Bedford.

For the best horse hoe for green crops on the flat, F. and J. Howard, Bedford, £2.

For the best machine for setting out turnips on the ridge or flat preparatory to singling, Thomas Huckvale, Choice Hill, Chipping Sodbury, £5.

For the best reaping machine, Dray and Co., Swan Lane, London, first prize, £5; second ditto, J. L. Bowhay, Modbury, £2.

For the best haymaking machine, Smith and Ashby, Stamford, first prize, £2; second ditto, Wightman and Dening, Chard, £1. Highly commended, Ransomes and Co.

For the best horse rake, for hay or corn, J. and F. Howard, Bedford, £2.

For the best portable steam engine, not exceeding six horse power, Messrs. Hornsby, Grantham, first prize, £10; second ditto, Tuxford and Sons, Boston, £5. Highly commended, Barrett and Exall, Reading.

For the best portable combined thrashing machine, to be driven by steam, not requiring more than six nor less than four horse power, E. and T. Humphries, Pershore, £5. Highly commended, Tuxford and Sons, Boston. Commended, Barrett and Exall, Thomas Brinsmead, jun., and King.

For the best portable thrashing machine, not requiring more than two horses, B. J. Webber, Newton Abbott, £5. Highly commended, Barrett and Exall, Reading.

For the best straw shaker, Mr. Henry Brinsmead, St. Giles's, Torrington, £1.

For the best cloverseed drawer or sheller, Mr. Archer, 16, Aldersgate Street, London, £2.

For the best winnowing machine, Messrs. Hornsby and Son, Grantham, first prize £3; second ditto, Messrs. Marychurch and Son, Haverfordwest, £1. Highly commended, Mr. J. T. Knapp. Commended, Messrs. Holmes and Sons.

For the best one horse cart, for general purposes, Thomas Milford, Thorverton, Collumpton, £3. Highly commended, Wm. Busby, Newton le Willows. Commended, George Milford.

For the best two horse waggon, Thomas Milford, Thorverton, Collumpton, £3. Commended, George Milford.

For the best and most economical rick stand, Marychurch and Sons, Haverfordwest, £1.

For the best chaff cutter, worked by horse or steam power, Mr. James Cornes, Barbridge, Nantwitch, £3. Highly commended, Mr. H. Carson.

For the best chaff cutter worked by hand, Messrs. Ransomes and Sims, Ipswich, £2. Highly commended. Mr. Cornes. Commended, Messrs. Dray and Co., and Messrs. Smith and Ashby.

For the best turnip cutter, for cattle, Ransomes and Sims, Ipswich, £2.

For the best turnip cutter, for sheep, Ransomes and Sims, Ipswich, £2. Commended, Marychurch and Sons.

For the best corn and pulse bruiser, Ransomes and Sims, Ipswich, £2. Commended, E. R. and F. Turner.

For the best oilcake crusher, suited to crush every description of cake, Messrs. Hornsby and Sons, Grantham, £2.

For the best and most economical steaming apparatus, for preparing food for cattle, pigs, &c., B. J. Webber, Newton Abbott, £2.

For the best churn, Dray and Co., Swan Lane, London, £1.

For the best cheese press, Wightman and Dening, Chard, £1. Highly commended, Hugh Carson, Warminster.

For the best collection of small edged and other small tools used in husbandry, comprising not less than twenty, Dray and Co., Swan Lane, London, £2.

For the best collection of draining tools, Dray and Co., Swan Lane, London, £2.

SPECIAL AWARDS.

For a clodcrusher and Norwegian harrow combined, Busby, Newton le Willows, 1*l.*

For a patent liquid manure distributor, to hold 280 gallons, James, Cheltenham, 10s.

For a Moody's patent turnip cutter, Carson, Warminster, 2*l.*

For a patent turnip cutter, for cattle or sheep, Barnard and Bishop, Plymouth, 1*l.*

For an American hay collector, Rowsell, Buckland St. Mary, 10s.

For a Chandler's patent liquid manure drill, R. and J. Reeves, Bratton, 1*l.*

For a Chandler's patent liquid manure drill, with Reeve's patent improvements, R. and J. Reeves, Bratton, 1*l.*

For a corn and pulse bruiser by steam power, E., R. and F. Turner, Ipswich, 2*l.*

For a bruising mill, for hand, horse, or steam power, Ransomes and Sims, highly commended.

For a patent combined boring, mortising, tenoning, and drilling machine, Coulson, York, 1*l.*, and commendation.

For a Jack's patent lawn sweeping machine, Holmes and Sons, Norwich, 1*l.*, and commendation.

For a single row hand turnip and mangold drill, Holmes and Sons, Norwich, commended.

For a mincing machine, Archer, Aldersgate Street, London, highly commended.

For a Gilbert's patent sackholder, Chard and Munro, Bristol, highly commended.

For a cheese pan, and for process of heating curd, Cockey and Sons, Frome, 1*l.*, and highly commended.

For a patent eaves gutter, Colthurst, commended.

For a patent balling instrument, Huckvale, Chipping Norton, commended.

For machines for cutting meat or vegetables, Lyon, Finsbury, London, commended.

For a double cottage beehive, Westcott, Thorverton, highly commended.

For plans of cottages for labourers, Hickes, Bath, prize.

THE VALUE OF A GARDEN.—But I hold that any farmer, who is worthy of the name, will prepare a small plot of ground for wife and daughters, and that he will, out of love to them, make it all they can wish or desire. It is these little things that make home pleasant and happy; and it has been the lack of these that has driven many a loving heart out into the world and away from a sterile, barren home. Give the wife and daughters a place to plant, tend, and rear their flowers; help them, if needs be, although it may take an hour sometimes that is hard to spare, and you will a thousand times bless God for so ordering your mind that you did it. What husband or father, rugged though his nature may be, does not fondly linger round a home made so bright and cheerful by the fairy hands of his wife or daughters, scattering, as it were, in his way, the beauties of their little plot? What son or brother ever forgets his home who has found his room daily perfumed with the flowers which have been raised by the hand of a fond mother or gentle loving sisters, and placed there through the promptings of their own dear affectionate heart? What daughter ever forgets the home where she has cultivated her little garden, and year after year been so happy in the blossoms which have been borne upon the plants she has watered and tended with such patient care? Parents, brothers, sisters, the dear old home, all—all come back to her, though years may have passed away, in the scent or bloom of every flower. The family is seldom unhappy, whose dwelling is surrounded with shady trees, and whose garden is gay with cultivated plants. Do not, then, I beseech you, forget the little flower garden.—*Mr. Peters's Address.*

ON THE NECESSITY FOR BETTER FARM ROADS.

There is scarcely any subject so intimately connected with the convenience and business of the agriculturist that has thus far received so little attention as the economy of good farm roads. In our almost general advance, these still remain much the same as they long have been. We yet see the harvest-load fighting its way up the narrow lanes, with every hedge and tree taking a due tithe of the crop. We may often enough, even now, come across a good team pulling each other to pieces, with the wheels of the market-waggon or dung-cart nearly buried in the ruts of the road from the homestead. The sharp turn—the awkward, uneven drop—or "wooly" bottom, how much have these to answer for, in breakdowns and overthrows, just at a period when time is everything, and horses should travel fresh, safe, and fast!

The Central Farmers' Club, then, pretty generally admitted to select its subjects with some care and judgment, did well enough to place this one on their card. It came to a hearing on Monday evening last, the chief part in the performance being entrusted to Mr. Bailey Denton, a gentleman who only a few months back signalised himself by reading to the members of this same society a very able paper on land drainage. We wish we could pay him as hearty a compliment on this present occasion. That this paper, too, evinced much ability, we shall not for a moment attempt to deny. His reasoning was logical and well put, while the reform he contemplates has at least the promise of working better than the system we are now tied to. Mr. Denton, however, as we take it, was more or less out of order. Highways and highway rates are by no means an uncommon thesis. Plans for improving them, or preserving them, or paying for them, have been written on, and talked on, and even legislated on, over and over again. We repeat, that Mr. Denton writes and talks about them with considerable ability, emphasis, and experience; but this was not exactly what the club came to hear about. The introducer of a subject must, of course, give the cue to the subsequent discussion. It was so here. Mr. Baker, however, who rose as Mr. Denton sat down, began by stating that "he had supposed from the question on the card that the observations of Mr. Denton would have applied rather to the construction and management of roads for the convenience of home-stalls which were now without them, than the roads of the entire kingdom." Mr. Owen "concurred in the disappointment of Mr. Baker at more not having been said with regard to roads leading to and from the farm." We certainly concur with both of them.

Mr. Denton's answer to this is, that he found the general subject the more important question of the two, and so sacrificed the other to it. Considering the scene at which his paper was to be produced, and how much had already been said about the one and how little about the other, we think there is some reason for the disappointment expressed. Moreover, like Sam Weller's grand secret in the art of polite letter-writing, viz., to say so little as to make people wish there was more coming, the little Mr. Denton did offer on farm-roads only served to show how much more he might have said. "Those internal communications to reduce the cost of horse labour;"—"Good heavy farms vacated for the want of internal roads;"—"It is by no means visionary to refer to tramways for the common service of well-arranged farms;"—"A tenant paying a fair rent without any road at all, might well afford to pay something for a good one." How suggestive all these points are! but, unfortunately, they are little more than suggested. The possibility, for instance, of tramroads for farm purposes might have been discussed with very palpable advantage: to some limited extent they are already in use; while in laying out farms and farm-buildings on the better system we are now approaching to, it is impossible to say how much more general these tramways might become.

The discussion, as it is, reads more as a prologue to the reproduction of Sir George Cornewall Lewis's measure for the management of highways. The chief feature in this is a concentration of interest and direction from parishes to unions. Regarded as an agricultural question, it would seem to be one upon which opinion is at present by no means unanimous. Of the two, indeed, we should say the farmers on Monday were rather against it.

"The economy and cost of good roads"—to be considered, that is, as farmers' roads—is a topic the Club may very usefully return to. Mr. Denton himself, we believe, may be able to tell them far more on the matter than he yet has done, while many would be able and anxious to speak to it. As it is, the gentleman who is about to write the prize essay for the Royal Agricultural Society is by no means forestalled.

LONDON, OR CENTRAL FARMERS' CLUB.

THE ECONOMY AND COST OF GOOD ROADS.

The last meeting previous to the adjournment for the summer and autumn was held on Monday evening, June 4, at the Club-house, Blackfriars, Mr. Shearer in the chair. The subject for discussion, introduced by Mr. J. B. Denton, of Stevenage, Herts., was "The economy and cost of good roads."

The CHAIRMAN said, it must be in the recollection of every member of the club that a few months ago they were indebted to Mr. Denton for one of the most excellent lectures on drainage that had ever been delivered in that or any other institution. To-day that gentleman would again appear before them, he having kindly undertaken to open the discussion with a paper on the economy and cost of good roads, a subject which he was certain Mr. Denton would treat in a manner that would prove alike interesting and instructive to them all. (Hear, hear).

Mr. DENTON said: When I had last the pleasure of reading a paper before this club, on the practice of land-drainage, I refrained from proposing or suggesting any resolution on the discussion that arose, because the subject was one which admitted of much difference of opinion amongst us. But in the present instance there is not that room for difference; and I shall not hesitate to ask of you an expression of opinion. We are about to discuss "The Economy and Cost of Good Roads;" and as all persons—from the child with his little wheelbarrow to the universal public who accumulate by railway trains—will admit the advantage of good over bad roads, nothing need be said to support the preference so manifestly natural, and so generally felt, that, irrespective of cost, the more perfect the road the better it is for the passenger. I believe, with the late Sir Robert Peel, that true economy in road management consists in that combination of care and judgment which shall ensure the best result from the least comparative outlay, without any other consideration whatever; but as superiority in result is only one element in that combination, and as the occupiers of land (that class especially represented by this club) are by far the largest contributors towards the cost and maintenance of roads, it becomes quite as much our duty to check ill-advised expenditure in all its details, as it is the object of the general public to have good roads at any price. Perhaps nothing could more appositely preface our discussion than the definition of what a perfect road is, as it will enable us to comprehend how far from perfect our roads still are, though so vastly superior to what they were fifty years ago, and how susceptible they are of further improvement. "A road, to be theoretically perfect," says Dr. Lardner, "should be, first, perfectly straight; second, perfectly level; third, perfectly smooth; and fourth, perfectly hard. If it possessed all these qualities in absolute perfection, the consequence would be that it would require no tractive power at all—an impulse given to a load at one end would carry it to the other by its inertia alone. This is the ideal limit to which it is the business of a road-maker to approximate as nearly as he can, all practical circumstances being considered." But the Doctor further observes, "that it is obviously impracticable to make roads in the country which would be perfect: there arises in most cases the extremely difficult inquiry as to the best possible compromise which can be made between all the inevitable imperfections, the existence of which we are forced to admit."—See evidence before Committee of the House of Commons, 1836. Now, although this definition will serve the good purpose of showing us our defects, it is not my intention to rest upon anything that savours of theoretical and impracticable perfection; but to proceed with the subject in that way which shall most pointedly, and in the shortest manner, bring us to a true understanding of our own position as tenant-farmers, who are not only maintaining, for the most part, the public thoroughfares of the country, but are necessarily obliged to maintain the private or farm roads within our own occupations, where we are fortunate enough to possess them. In the first place, we will have regard to the turnpike and parish roads—those roads which are called "public," and supported by tolls and rates; and in the next place we will refer to those roads which afford internal accommodation to farms, which are called "private," and which are solely maintained by those who possess them. When treating of public roads, the question of their economy and cost has reference to their maintenance, rather than to their formation; and to this view of them we must confine ourselves on this occasion. It is in consequence of the vast change that has recently taken place in the system of our national intercommunication that the consideration of the matter should not be delayed. Railways are, in fact, fast superseding or detracting from the use of the principal coach roads, and we shall therefore be better employed in considering their future support and management, than in discussing any improved means of making new ones; particularly as we find by every day's experience that the more railways are extended and appreciated, fresh lines of existing highways are opened up, radiating to the numerous railway stations, by which neglected parish roads are brought into use, and their imperfect character brought to light. The effect of this vast change is becoming gradually known to us all in one way or another. If we are trustees and bondholders of turnpike roads, we know it by the insolvent condition of our trusts; although the annual expenditure on turnpike roads has been reduced in eight years to an extent of more than £400,000 per annum. As ratepayers we know it by the increased amount of the highway-rates;

which, in the same period of eight years, have increased above £600,000 per annum, with the outlay disproportionately increased in those particular parishes lying nearer the railway stations and through which the traffic from the more distant must pass without contributing to that extra cost; and, as part of the general public, we know it by the total neglect of those roads which have had their traffic diverted, and by the unequal condition and the absence of judicious control of the roads generally. Of course there is no rule without an exception, and districts may exist where turnpike trusts are still thrifty, and where uniformly good management by parochial authorities is prevalent; but I think there is no one here present who has failed to observe the ill consequences accumulating throughout the country from the bankrupt state of turnpike trusts, through the neglect of irresponsible trustees, and from the fact that parish roads still remain under the control of unpaid and unpractised surveyors, serving only for a single year. With respect to such roads, we have all, I dare say, had some experience; and I am not misrepresenting the fact when I say that there are not a few who have felt the necessity of acting as surveyors of highways in our several parishes as a means of self-preservation; as a means, in fact, of remedying the omissions of preceding surveyors, who may, perhaps, have been more liberal near their own occupations than ours. I will freely confess that it was the total neglect of the roads in that part of the parish in which I resided that induced me, a few years back, to seek the office, and then I did not fail to make the best use of the opportunity to give the neglected roads a dressing, which, I believe, my successors have considered so abundant that they have done nothing to them ever since. But leaving individual cases out of consideration, we must all acknowledge that unpaid services are generally of little value, and that no man whose income depends upon a profitable use of his time ought to be called upon to devote a part of that time to periodical business without compensation; and further, if we examine the matter attentively, we shall find that the knowledge and application essential to a good management and economical maintenance of roads is comparatively rare. It is too frequently believed that any parishioner who can be trusted to collect and dispense the highway rates is qualified to act as stonewarden of his parish; and it is this unfortunate theory, that trustworthiness is synonymous with knowledge, supported by erroneous notions of economy, that has led to the defeat of every measure which has been proposed for the improved management and union of public roads in districts. It may be true that a person may be a good manager of existing roads, without being able to enter into such refined calculation, for instance, as the resistance of friction and collision of material, the force of gravity in impeding draught on roads at different gradients, and the amount of impediment arising from elasticity of formation. These, however, are elementary data indispensable to a good road maker, and though, perhaps, not so necessary to a road manager, it is manifest that a knowledge of the whole subject in its various details must better qualify him for his duties than the possession of accidental information, acquired in the pursuit of another business. Under any circumstances we shall all agree that any one taking the management of our parish roads should at least appreciate the advantage of a perfect surface draining and under draining of roads, and the benefit of sun and of air; the proper sectional formation for different roads, according to circumstances of position; the relative value of materials, in comparison with the cost of procuring them; the proper size of material by which to maintain the bottom stratum as well as the surface covering; the quantity to be applied to the best advantage at each dressing, and the best time of applying it, and particularly the economical application of labour in a broad engineering sense, not as meaning the crowding of men on the roads when it is not possible to find work for them on the farm. These and such like practical considerations, we must all admit, it is necessary a surveyor of the highways should be able to apply in all the details of his office. How few there are who at the present time undertake the duties possess even this essential knowledge, or, if they possess it, how few will give the necessary time to its profitable application! But as we have now arrived at the critical period when the trustees of turnpike roads are taxing the parishes through which they pass, under Sir Charles Burrell's act, to contribute to the roads they undertook to maintain, and when the whole traffic of the country is being changed from former channels to courses at right angles to them, I venture to hope the farmers of England will see it is time we changed the system of management also; that, in fact, we should look to our own interests as ratepayers, and abandon the unsatisfactory and, in the main, costly agency of paid surveyors and paid clerks to turnpike roads, and unpaid and annual parish surveyors of parish roads, and adopt the more consistent, and, in the end, less costly machinery of consolidated authority. It will hardly be credited that, although there are only 10,700 parishes in England and Wales, there are 15,841 distinct places levying highway rates; and that, although the turnpike roads are costing less every year to maintain, the expenditure on highways, which in 1827 was £1,100,000, and in 1839 was £1,169,891, amounted in 1845 to £1,717,334, without any appreciable increase in length of the highways themselves; but all this is true, and it is to the expediency of consolidating these numerous jurisdictions into unions, with an equalization of expenditure, that I hope you will address yourselves this evening. In the year 1850, Sir George Cornewall Lewis, now the Chancellor of the Exchequer, introduced a bill into the House of Commons having in view the union of parishes in districts, and the concentration of the unpaid officers of parishes into one paid officer for each union. As you are aware, it did not become a law—simply, I presume, because the time was not then ripe for the acceptance by the country authorities of the principles distinguishing that measure. But five years have since elapsed, and country as well as towns are rapidly acknowledging the union of extended management as the most effective and most economical system of management. I shall therefore not be outstepping the

duties I have taken upon myself in this discussion in placing before you the scheme of Sir George Cornewall Lewis, with such additions as shall retain in the hands of the rate-payers certain powers of appeal and scrutiny which, I would submit, it is desirable they should continue to hold. Under any circumstances, although there may be difference of opinion in details, it will serve to bring into comparison with the present divided and unsatisfactory mode of management the principles of union management. The main points of the scheme are these : — 1st. The districts of road management shall be co-extensive with the unions. 2nd. That a competent surveyor of roads shall be appointed to each union, or to two or more unions, according to the extent of mileage of roads within such union. 3rd. That directly any portion of the highway rates of a parish is applied to the maintenance of a turnpike road, that turnpike road shall be placed under the management of the surveyor of the union. 4th. That the surveyor shall be nominated by the board of guardians, and if approved (after examination of his qualification for the office) by a central board of examiners appointed by the Board of Trade, shall receive the appointment. The board of examiners will be similar in character to the official referees of the metropolis, where the district surveyors for buildings undergo examination as I propose here. 5th. That there shall be a select committee of the Board of Guardians, to be called the Roads Committee, to whom all complaints of rate-payers and all accounts respecting the roads shall be referred, whose decision on such complaints shall be binding on the surveyor, except in such instances as the surveyor may elect to appeal to the central board of examiners. 6th. That the salary of the surveyor shall be regulated by the mileage of, and duties upon, the roads under his management. 7th. That such surveyor shall make half-yearly statements, showing the length and cost of maintaining each public highway within the several parishes, distinguishing the cost of labour and materials; and such half-yearly statements shall be affixed to the church-door in each parish, within a month of the termination of each half-year, for the inspection of the ratepayers. 8th. That such surveyor shall furnish the board of guardians with a complete annual statement of the total cost of the maintenance and management of the roads under his charge, together with an estimate of the works required for the next year; which having been audited as part of the accounts of the union, the clerk of the board of guardians shall reduce the whole into an abstract form, and forward it to the clerk of the peace of the county, in order that it may be published in the county newspaper, and forwarded to the Board of Trade once in every year, concurrently with the other unions throughout the country. This will enable all persons to compare the cost of management and maintenance of the several unions, and will prevent jobbery. 9th. That the several abstracts so published shall be formally collected by the Board of Trade from the several unions throughout the country, and presented annually as a parliamentary paper to the House of Commons. These suggestions will be found to differ in some few particulars from the *modus operandi* set forth in Sir George Cornewall Lewis's bill, though the principles involved in both are the same. They have in view the constitution of a uniform system of management, with such security on the score of competency that, as the several turnpike trusts expire or turnpike roads are thrown on parishes to support, we shall have in existence an executive conducting the maintenance of highways superior to, and much less costly than, the divided and irresponsible system which prevailed in the management of turnpike roads in their most palmy days, and which had the effect (even before railways robbed them of much of their incomes) of gradually bringing the majority of those trusts into irrecoverable debt. I have laid great stress upon the perfect competency of the surveyor; for although there should be in each union a road committee, so as to preserve the English principle of leaving local affairs to local management, still it will be found in practice that the real *onus* will rest with the surveyor, who should be obliged to devote the whole of his time to the duties of his office; and you will have observed that I have suggested, by an appeal to the road committee, a summary mode of redress for inattention on the part of the surveyor. This is desirable, in order to avoid the expenses of an indictment. It is estimated that a person fully understanding the business of road management may look after from 150 to 250 miles of roads of ordinary character, and that this latitude in figures will represent the roads within an area ten miles square, containing 64,000 acres. There are in England and Wales 104,772 miles of highways, and 57,805 square miles of country, so that we may see at once that there is not on an average a length of two miles of highway to a square mile of country. In Westmoreland there is hardly one mile of highway to a square mile of country, whereas in Devonshire there are nearly three miles to the same area. Competent persons are to be found who will undertake the duties for from £150 to £200 a-year, to which, if £40 were added for keep of a horse, the average salary would be raised to about £220. This would be equal to about £1 per mile of ordinary country roads; or, to place the matter tangibly before you, so that we may see how such a salary would affect our pockets as ratepayers, it is estimated that from ¾d. to 1d. in the pound would satisfy the salary of the surveyor under such an improved mode of management. We can each of us compare this with the salaries paid to and duties performed by surveyors of turnpike trusts, and with those isolated instances where salaries are paid to stonewardens in parishes where payment is made for superintending the highways; and I think we shall admit that, looking forward to the time when turnpike roads will come under the management of the surveyors of roads in unions, and the expenses attending the present management of such turnpike roads may be saved, there will be little or no loss in the item of salaries by the change of system. To make this more apparent, it may be well to state that there are nearly 1,200 turnpike trusts in England and Wales, having a management of a length of between 23,000 and 24,000 miles, of which a

considerable number do not receive sufficient in tolls to cover the cost of repairs, and pay the interests of their debts (which amount in the aggregate to about 7½ millions), and must sooner or later receive assistance from the highway rates, if they do not do so already. These bankrupt trusts, however, are still represented by paid surveyors, whose salaries have to be paid; and though these salaries have been reduced, the aggregate amount of what is still paid would go far towards the cost of road management in districts. The salaries paid to clerks and surveyors for the superintendence, law, printing, advertising, &c., amounted, I find, in 1834, to above £180,889, or £8 a-mile. Now, as there appears to be in England and Wales about 130,000 miles of public roads of all kinds, the amount paid to lawyers and road surveyors for the 23,000 miles of turnpike roads alone would, under consolidation, more than pay the salaries of all the surveyors required for the management of the 130,000 miles of public roads of all kinds, assuming that the estimate of £1 per mile is sufficient payment to the surveyor, with 25 per cent. added for costs and expenses attending the machinery of concentration. You will observe that I have said little about the financial position of turnpike trusts; it is too difficult a subject to introduce into this discussion. I am content to assume that as soon as any turnpike trust applies for parochial relief, it shall be treated as a pauper and sent to the union, by which the expense of management attending such trusts will be saved for the district through which it passes. I find the highway-rates levied in England and Wales for the repairs of parish roads vary very considerably. In Lancashire, Lincolnshire, and Cambridgeshire the rates appear highest, and the cost of the repairs correspond. The rates in these counties are about 10d. to 11d. in the pound, and the cost of repairs from £17 to £21 per mile. In Westmoreland, Cumberland, Devon, and Norfolk the rates are lowest. In these counties they vary from 3d. to 6d. in the pound, and the cost of repairs is as low as £4 6s. to £5 7s. per mile. The average cost of repairs of highway is £11 3s. These figures will enable us to contrast the single item of effective superintendence at 1d. in the pound, or £1 per mile, with the present cost of imperfect reparation, under management partly gratuitous and partly paid for; and it will not be difficult to believe that the gain in the cost of maintenance to be secured by consolidated management in qualified hands will be ten per cent., which is more than enough to pay the whole cost of superintendence. In closing this part of the subject, I have only to express the hope that the resolution which shall emanate from this club will convey an acknowledgment of the evils attending the present mode of managing public roads, and the advantage to be gained by consolidation. The experience, or rather the want of experience, we have had of the 5th and 6th William IV., cap. 50 (which enabled parishes to combine voluntarily), and has remained a dead letter, will oblige us, I think, to add, that any legislative measure, to be operative, must be compulsory. Time will admit of my saying but little upon the second part of the subject now presented for discussion. I refer to the economy and cost of private roads; those internal communications within the farm which serve to reduce the cost of horse labour in the traffic through and upon it. It has fallen to my lot, when acting as engineer to the General Land Drainage and Improvement Company, to hear all kinds of opinion of the value of farm roads. I have known good heavy land farms vacated and remain unoccupied for the want of internal roads, and, as the very opposite of this fact, I heard one farmer in the Vale of Belvoir assert last week, when the question was asked him, what additional rent he was willing to pay for the accommodation of a road through the middle of his land, from the public highway to his homestead, that he could do as well without the road as with it, if he was to be charged anything for it. Now, when I state that the farm referred to was entirely on lias clay, and that there was only a field track marked by ruts, in which a dog could run without being seen, and that the homestead was 70 chains from the highway referred to, I am sure there is no one here but who will admit, that if the tenant was paying a fair rent for the land without any road whatever, he could very well afford to pay something for a good one. But I do not refer to this case with any intention to show that this particular person was wrong; it is mentioned simply as an instance of contradiction to what would appear incontrovertible. Macneill has shown us, by actual experiments made on the London and Shrewsbury turnpike road, that the comparative force of traction required to draw a waggon weighing 21 cwt. over a well-made pavement was 33lbs., over a broken stone road of great hardness was 46lbs., and over a gravel road was 147lbs.; but I am unacquainted with any experiment showing the tractive power required to move a waggon of 21 cwt. through a lias clay soil during the wet seasons of the year. We do know, however, from actual recorded trial, that the mere difference of whether a gravel road be wet or dry changes the figures representing the draught from 13 when dry and clean to 32 when wet and muddy; and when we contrast these figures with those I have just quoted, we shall be able to appreciate the resistance of strong and wet clay. It is not possible to find material affording so many elements of resistance to motion as unmitigated clay during nine months in the year; for in addition to the impeding power of collision, friction, and gravity, you have the influence of adhesion, which adds weight to resistance; and it is this consideration, I presume, that has led the Royal Agricultural Society of England to offer a prize for the best essay on "Farm-roads," with particular reference to clay farms. In all soils, their power to resist motion will, of course, depend upon their want of hardness and consistency in a natural state, influenced by its adhesiveness when wet; and the relative value of internal roads to farms will be in proportion to the quality of the land in those several respects. In tenacious clay soils the want of roads will be felt most; in free gravelly soils it will be felt least. Though anxious to gain an unanimous admission of the economy of good farm-roads, I will not dwell long upon the importance of a level way or easy gradients in the roads we use. It is so seldom that we can venture upon cuttings

and embankments for farm accommodation, that it will suffice to illustrate the advantage of a level road over a hilly one by stating that whereas the number of tons a horse can draw on a hard inflexible tramway (and it is by no means visionary to refer to tramways for the common service of well-arranged farms), where the ground is level, is 13; the number he can draw, where the gradient is 1 in 100, is only 4½. But this comparison hardly puts the case tangibly, nor in a homely view. We find many farms abound in steep hilly slopes with inclinations of 1 in 30, or even steeper; and it will be more to the purpose, therefore, to state that it has been practically demonstrated that the expense of power in £ s. d. required to draw a load of one ton along a common road of various gradients is as 6d., where horizontal, to 8d. where there is a rising gradient of 1 in 30. If we adopt this comparison, and I feel sure it will be found very near to the fact, we see that (all other points being equal with respect to formation and condition) the comparative saving of a level road over a rising gradient of 1 in 30 is 2d. per ton in the ordinary cost and application of horse labour on a farm. As a level road is manifestly more economical than a hilly one, so a straight and hard well-made road is better than a tortuous field tract over a tenacious soil. This twofold proposition is so manifest, that it needs no proof. But in order further to test the important question of "What is the value of a farm with good and sufficient internal communication, and what the value of the same farm without any?" let us suppose a farm of 500 acres of a heavy clay soil, with the homestead in the centre, and good public roads on two sides of it: 500 acres will cover a square of 7 furlongs each side. Now it would probably require two miles of road to give moderate accommodation to such a farm. This, at an average price of £5 a chain, will cost £800, and if we take the interest at £5 2s. 10d. per cent. (the rate of instalment for repayment of principal and interest charged by the General Land Drainage and Improvement Company), the annual charge will be £41 2s. 6d. Is such a farm permanently improved by the acquisition of a road to the annual amount of £41 2s. 6d., or 1s. 8d. per acre? When we consider that this annual sum of £41 2s. 6d. will barely cover the keep of one horse and a half (it does not much exceed what I understand to be Mr. Thomas's statement of the keep of one horse), without regard to the wear and tear of the horse itself, and of carts, harness, and implements, I think we shall all answer in the affirmative. In such a farm of 500 acres, 400 acres being arable, and 100 acres pasture and weadow, the produce of manure will be, under ordinary good management, from 1,400 to 1,500 tons of manure in the whole. This will suffice to give a dressing of 12½ tons to 116 acres, and the number of miles travelled in doing that will be 966, out and back, if we take the average road-lead to be one-third of a mile, or 27 chains. Now if we remember that in heavy land we may not only pull our horses to pieces, but positively injuriously affect the land itself if we do not take advantage of every hour of dry weather, but prolong the operation during wet weather, it is hardly possible to overrate the advantage of a hard road, which will allow of a horse to travel at least 20 miles daily with the same ease that he will travel 12 or 13 miles, doing the same work through clay mud. I repeat the difference of 28 days, which these figures show in the time it will require to get manure on to the land is one consideration which will go far to meet interest on the outlay of making the road, leaving out of consideration the injury done to tillage as well as damage to horses by carting over clay soils in wet days. If, therefore, we add all these advantages together, the gain in time, in power, in the wear and tear of carts and implements, and in the personal comfort of the occupier, there can be no doubt that 1s. 8d. per acre represents at least the value of the improvement in this assumed case; and we shall not be outstepping truth and practice in the resolution we may adopt, if we assert in general but decided terms, that the existence or non-existence of internal roads on a farm is an essential element in determining the rent that should be paid for it; and that the provision of farm-roads being a permanent improvement, and in the case of clay soils a very costly one, the outlay is properly a landlord's and not a tenant's duty. It was my intention to have given some details of the mode of making private roads, particularly through clay lands and fen lands, where they are most wanted, but time will not permit. Suffice it to say, that the advantages of laying the bed of the metalling securely dry by longitudinal under-drains—one on each side of the metalling—and laying the surface of the road dry by open drains on each side of the formation, are points of practice now fully acknowledged, as well as the profitable use of burnt ballast (*i. e.*, burnt clay lumps) as a bottom stratum in those clay or fen land districts where harder materials are not to be obtained except at too great a cost. This will apply to the London clay, Oxford clay, and lias clay districts, and to the fens of Lincolnshire and Cambridgeshire, where miserable boggy droves still exist, as the only means of approaching the lands of numerous owners and occupiers, who, by combination, could take advantage of the present facilities of applying borrowed capital repayable by instalments for the purpose of making roads, just as easily as single landowners may do the like for draining and the erection of farm buildings. I beg to place before you some cross sections of roads, which may elicit discussion on the practice of road making, and of which I shall be happy to afford every explanation. You will observe that in each case the drainage for both surface and subsoil has been most carefully considered as the first essential in road making. The price per chain of making roads will necessarily depend upon locality. I am now engaged in making them at prices varying from £3 to £6 10s. per chain. The sections placed before you refer to farm roads made in various parts of England. No. 1 shows a road made in the new red sandstone district, of which the bottom stratum, six inches thick, was formed of a rough paving or blocking of the local sandstone rock, covered with four inches of the best limestone in pieces that would pass through a two-inch ring, at a cost of from £4 12s. 6d. to £6 17s. 6d. per chain. No. 2 shows a road intended for a fen district, in which per-

forated bricks, laid flat in a convex base, and covered with burnt ballast, form the bottom stratum. The surface covering is intended to be screened gravel. The estimate cost of this road is £5 17s. 6d. per chain. No. 3 shows a road made in the stiffer lias and Oxford clay districts. The bottom stratum is of burnt ballast, and the top screened gravel. The cost of this description of road varies, according to the price of coal and gravel, from £4 10s. to £5 10s. per chain. No. 4 shows a road in the London clay district. The bottom stratum is of chalk, and the top of screened gravel. The cost will vary, according to the depth of the chalk lying immediately below the clay, or the distance from whence it can be obtained, from £3 10s. 6d. to £4 15s. per chain.

Mr. R. Baker had supposed, from the terms of the question stated on the card, that the observations of Mr. Denton would have applied rather to the construction and management of roads for the convenience of homesteads which were now without them, than the roads of the entire kingdom; because in some districts the roads were made upon a different principle, managed in a different manner, and maintained in a better state than others. In Essex, for instance, the cross roads were generally equal to the turnpike roads of other counties; and he did not know a piece of road in the county over which a chaise might not run with as perfect ease as on any turnpike road in the kingdom. And this result had been achieved by the local management of the parishes (Hear, hear). The question had of late been brought prominently before the notice of the people of Essex, by reason of the attempt which had been made there to extinguish turnpike trusts altogether, and transfer them to the hands of the parishes, who it was thought would manage them as well, if not better, and at a less cost, than the road trust. He had lived long enough to learn when, in matters of this kind, consolidation took place, that instead of things improving, they generally became worse (Hear, hear). The difficulty of obtaining a good local surveyor was a serious one; but undoubtedly every man who was appointed to that office in a parish must have, more or less, an interest in economising the funds of the parish, and would therefore be likely to incur the least expense. This had proved to be the case, especially in his (Mr. Baker's) district; and wherever an attempt to take the power out of the hands of the parishioners had succeeded, he found that the expenditure had considerably increased, whilst the work done was very little, if at all, better than before. At one time great jobbery existed under the Commission of the Turnpike Trust. Almost every commissioner had a gravel pit; and at the season of the year when his teams could do no other work, he would set them to cast gravel on the roads, for the purpose of swelling up his account, and in the process of carting the materials the roads frequently received more damage than benefit. After a time, an act was passed to prevent commissioners supplying road materials; and what followed? Why, that the commissioners employed friends to do for them what they could not do themselves; and the same system of jobbery was continued. Again, take the Surveyors' Act. Previous to the passing of that measure, surveyors were allowed to find materials, employ persons to work on the roads, and charge in the ordinary way; but the new act prohibited surveyors from supplying materials or employing their own teams on the road, except by the license of a magistrate. What was the result? Why, that the magistrate invariably gave the license, unless it were opposed by the parish. Thus, matters stood just in the same position as before the passing of the act. In the course of his experience, he (Mr. Baker) had had the construction of many miles of new roads entrusted to him; and in one particular instance they cost from £400 to £500 a mile. That arose partly from the difficulty of obtaining materials, and the distance they had to be carted. The course he had pursued was to drain the roads first, by cutting two parallel drains on the sides, where the ruts would work. These drains he filled in with stones, placing the usual road material at the top. The result was, that on these roads very little additional expense was incurred for many years afterwards. Experience and observation justified him in stating that the cost of making a drain for a perch or two was not so much as the cost of a cart-load of gravel conveyed a distance of a mile or two. If, therefore, they could substitute a drain for the supply of materials, great benefit would be conferred upon a parish by saving the cost of labour and carting eight or ten miles, and by not cutting up the roads adjoining, over which the materials were brought. He should recommend, therefore, that in all cases where the subsoil was absorbent or retentive to water, or, after a frost, the roads broke up and were rendered impassable, the first step for their improvement should be to construct a thorough drain. In the next place, the parish should look after its own interest in appointing a surveyor; and in reference to this part of the subject he would observe that he believed there were men in every parish as competent and willing to act at a small salary as the paid surveyors in a whole district or union. He objected most strongly to taking away local control over the expenditure for the construction and maintenance of these roads, which were never so well managed as by the parishioners themselves. Whenever they embarked a large amount of work to an individual who was not responsible, jobbery would be sure to creep in, and though they might succeed to the utmost of their desires in having good roads, yet the advantage might not be in proportion to the cost. He felt with Mr. Denton, however, that in districts where the roads were badly managed, and materials were not near at hand, it might be necessary to introduce an improved system; but in other districts, where the roads were as good as could be desired, and managed by the parishioners themselves, it would be worse than useless to interfere (Hear, hear).

Mr. Wood could not say that he differed much from Mr. Denton in what that gentleman had said on this subject. He had had a good deal to do with turnpike trusts in his own county (Sussex), and, having felt it his duty to oppose much of what had been taking place, he had often found himself in the position of being a mover without a seconder (laughter). In his county the two principal roads were affected in a great degree by the

vicinity of the London and Brighton Railway; and the mismanagement which had taken place was attributable not so much to the conduct of the country gentlemen, as to that of persons who, having accumulated a little money in London, had come to his neighbourhood to spend it. It was not the salaries of surveyors that he complained of, but the immense amounts which had been expended in law proceedings, and in obtaining fresh acts of Parliament; the want of concentration, one result of which was, that there was a separate clerk receiving fees on the several roads, whereas one clerk might manage all the roads in the county: all these things, and their attendant evils, had added very much to the burdens of the ratepayers. His experience with regard to such matters showed that there was a strong necessity for a centralizing power for the management of the roads. He recollected a meeting where there were seventy-five trustees assembled to discuss the question whether or not there should be a gate put up—a fact which clearly showed, in his judgment, that the power was not rightly vested. Having acted in the capacity of trustee for twenty-five years, he was strongly impressed with the necessity for some alteration; and for his own part, he approved of the principles of the proposition of Mr. Denton, which was, he presumed, almost identical with that of the measure brought forward by Sir G. C. Lewis, and which appeared to him to meet Mr. Baker's views—that of leaving the management of roads in the hands of the boards of guardians, who were certainly interested in keeping down local expenses. He thought there would in this case be no danger in resorting to union management. Parish management of turnpike roads was out of the question. The management of roads generally by parishes had proved very indifferent. In his own parish, as in Mr. Baker's, the roads in general were very good, because a railway happened to run through the parish, and the railway company were large contributors to the rates; but, as regarded the persons employed in managing them, he must remark that having attended the meetings for three years, to avoid being placed in the position of surveyor, on the last occasion, when he did not attend, he was, to his great annoyance, elected to fill the office. (Laughter.) He did think that persons who had other matters to attend to, which required all their time, should not be placed in such a position; and he thought that, under some such system as had been proposed that evening, the roads would be managed much better than they were at present. His proposition to his colleague immediately after assuming office was that they should immediately proceed to find out the best man in the parish to be the head of the staff, and not content themselves with employing any one who offered himself—(Hear, hear); that they should give a good salary to such a person to act as foreman, and to place men on the roads when they were really wanted.

Mr. Owen: You would make him assistant-surveyor?

Mr. Wood would prefer calling him foreman. As regarded draining for roads, very much depended on the nature of the district. No doubt there were many cases in which it would be very advantageous to get rid of the water in the first instance; but he did not apprehend that there would be much gained by draining a stiff yellow clay before the surface was laid down. He understood that Mr. Denton and Mr. Baker equally held draining to be important.

Mr. Denton: It is the first essential.

Mr. Wood said he had known instances in which farmers objected to the making of good roads, because it might increase their payments; but that was a view which was not likely to be supported there (Hear, hear). He entirely concurred with Mr. Denton as to the propriety of consolidating the management of all the roads of the kingdom, and at the same time keeping it in the hands of some such local authorities as the Boards of Guardians. What they should aim at was, the combination of the principle of centralisation with that of local management.

The Chairman said it was not for him, as Chairman, to express an opinion one way or the other; but perhaps he might be allowed to mention a fact which did not appear to be known to Mr. Denton, and which might assist in elucidating the matter. The question on which Mr. Denton and Mr. Baker were at issue was not whether there should be a paid surveyor—on that point they appeared to concur—but whether the repairing of the roads should rest with the residents in a parish, or whether there should be a union of parishes for that object. In the Isle of Wight it had been customary, for a long series of years, to act upon a united system. That island was, in fact, the model of the union system, with regard to the relief of the poor. As far back, he believed, as 1780, a union was established there for that purpose; and for sixty or seventy years the roads also had been under the management of a commission, selected principally from landlords and occupiers, and which employed two surveyors to take charge of all the roads in the island, subject, of course, to the supervision of the commission. It was astonishing for how little money the roads of the island were kept in good order under the operation of that system; and, having long been acquainted with the Isle of Wight, he might safely say there was scarcely a rate-payer in it who would not be very sorry to see a return to the old system of parish management. (Hear, hear). On the other hand, in the parish in which he lived, which was not a very large one, the maintenance of the roads was divided between four separate districts, in each of which a rate was levied. In his parish there were four distinct tithings for nothing else but the management of roads; and in the adjoining parish there were three. Such a system could not but work badly.

Mr. Owen thought the turnpike roads were so well managed under the new system of macadamising that there was generally but little room for further improvement. He must say he concurred in the disappointment of Mr. Baker at Mr. Denton's not having said more with regard to roads leading to and from the farm, over which the parish had no control. (Hear, hear). In that respect there was very great room for improvement,

and it was to be sought in a great degree through the felling of useless timber, and the lowering of hedges and fences, which were at present very much in the way. He had often passed through bye-roads and lanes which no one ever seemed to care or think about; and, considering how much many farms suffered from the narrowness of the roads and the overcrowding of timber and fences, he thought it would have been well if Mr. Denton had directed his attention to that branch of the subject. As regarded turnpike-roads, he thought there was generally not much cause to complain. No one could object to pay a moderate toll for passing along such a road as that from London to Bath and Bristol. It had always been the custom in his part of the country to appoint a surveyor annually; and, though he conceded to Mr. Wood that the work was sometimes done badly because a man was appointed to the office who knew nothing about its duties, yet the result was simply that under such a person matters were stationary, and then there came a surveyor who set a good example to his successors, and put all the roads in thorough order. When the roads were in the hands of a local surveyor, such a person, wishing to keep down expenses, could tell his neighbours that he wanted so much gravel on a certain day; teams were supplied to draw it, and the carting was effected by means of a system of mutual accommodation. The tendency of this was to keep down the rates; and if this management were transferred to the hands of strangers, he did not think they would have better roads or be in a better position as regarded their finances at the end of the year.

Mr. DENTON in reply said he was glad of an opportunity of explaining how it was that he had been led from the particular to the general question. The truth was, that he did intend to deal with the question of farm-roads when he proposed the subject for discussion; but when he considered this with the particularity with which he thought it his duty to regard it, the general question appeared to him of such paramount importance, that he felt bound to make it the particular one. Within the last twenty years the whole nature of their intercommunication had changed. The railway station was now the centre to which all things radiated, and the parish through which the railway passed was that which bore the greater portion of the burden (Hear, hear). He thought some consideration was due to the parish or parishes which happened to be in that position. As ratepayers in such places they would all desire a modification of the present system and an equalisation of rating. Hence it was that after having proposed to himself the treating of roads particularly with reference to farm accommodation, he had felt bound, in justice to the subject and to the club, to take a wider view. This was his explanation of his deviation from the line of observation which Mr. Baker had expected him to follow. It was, he believed, the interest of farmers to regard the subject under a general aspect. In his own parish he had seen men crowded upon the roads in a most undesirable manner under the new system of management spoken of by Mr. Baker; and he had seen material selected, not for its fitness or economy, but merely for its situation; men being employed to get it from a pit in the parish, when it was, in fact, more expensive than other material would be if brought from a distance. Both as regarded labour and material, he contended that it was not economical to leave the management of roads in the hands of the local ratepayers. As regarded figures, his estimate of £1 per mile for the management of highways had been objected to by Mr. Baker as excessive. He was of a contrary opinion; and when he compared £1 per mile for the cost of the management of highways with £8 per mile for the cost of turnpike-road management, he maintained that economy was on his side. Mr. Baker said the result of the proposed consolidation would be to take from ratepayers the management of their own concerns. He believed the whole spirit of Sir G. C. Lewis's measure—most certainly the spirit of his (Mr. Denton's) amended proposal, embodied in the paper which he had read—was that self-management should be retained, the management being vested in the boards of guardians as the representatives of the ratepayers. He trusted that any resolution which might be passed would be in the direction of supporting the principle of consolidation.

Mr. BAKER said the maintenance of the roads in his parish, and the adjoining ones, cost only sixpence per acre.

Mr. DENTON asked how many acres the parish contained.

Mr. BAKER said 8,500 acres.

Mr. DENTON repeated that he had had no desire to evade the subject of farm roads, and said he should like to witness the passing of a resolution declaring that, on clay lands in particular, the formation of roads was so expensive an affair that the outlay ought to be made by the landlord and not by the tenant, and that the question was really one of rent, to be settled after the road had been made by a comparison with the state of the farm previously.

On the motion of Mr. Owen, seconded by Mr. Baker, it was resolved:—

"That in the opinion of this club the formation and maintenance of good roads is worthy of far more attention than it has yet received from the agriculturist; and that a better system of management, both local and general, is, as a matter of economy, very desirable."

On the motion of Mr. Owen, seconded by Mr. Wood, a vote of thanks was given to Mr. Denton for the care and ability evinced by him in introducing the subject, and a similar vote was passed to Mr. Sherer for his conduct in the Chair.

IMPORTANT TO FARMERS.—ASPINALL *v.* ST. HELEN'S CANAL AND RAILWAY COMPANY.—This was an action brought in the Warrington County Court, on the 14th instant, by Mr. John Aspinall, late a farmer at Haydock, against the St. Helen's Canal and Railway Company, who sued them for the balance of his account, amounting to £16, for sundry damages and inconveniences caused by the removal of a canal bridge, which deprived the plaintiff of the

ancient way to some of his land, and for the deviating of the pure water from the place where the cattle on the farm had from time immemorial been in the habit of drinking; and for the erection of a fixed railway bridge in Parr, whereby the plaintiff could not get under with a load of either hay or straw, and consequently had to go a considerable distance round, thus losing time and being put to considerable inconvenience; and also for damage done by flooding, through the negligence and mismanagement of the Company's servants, in leaving a "new dow" in an unfinished state for months, and for land continually under poisonous water, caused by reason of the Canal Company regularly raising the towing-path side, whereby the water was thrown permanently on the contrary side of the canal; and for other minor losses. The Company had paid £3 on account, and had, since the summons was issued, offered him £4 10s. more, which he refused. On the morning of the Court, the solicitor of the company offered £10 and all expenses rather than go into Court, and which sum Mr. Aspinall accepted, and thus saved the Judge the trouble of examining (it is said) one of the largest number of witnesses that had ever been summoned to give evidence in that Court; and, through the obstinacy of the secretary of the Canal Company (although he had paid a similar bill before) it has cost a great amount of expense and unnecessary trouble on all sides.

INAUGURATION OF THE NEW CATTLE MARKET.

On Wednesday, June 13, the New Cattle Market in Copenhagen-fields was formally opened by his Royal Highness Prince Albert, attended by the Lord Mayor and a state procession of civic authorities. In one brief sentence, the whole thing was well done. It is seldom the City has had a better excuse for a little merry-making, and as rarely should we think has it turned the occasion to better account. Whatever the Corporation of London may have or may not have done; however unwillingly, perhaps, at first it may have entered on this duty, it is very certain that the new market will always speak to its credit. The removal of Smithfield had long been looked upon as a necessity, and argued on accordingly only as a question of time. Public opinion would, no doubt, have accelerated the settlement of this question, without being too tolerant of the many difficulties actually associated with its proper adjustment. These have all at last been overcome; and though our patience may at times have been tried, our approval is now fairly earned.

We can say honestly, that no journal has continued to labour more earnestly for that happy consummation which we witnessed this last week than the *Mark Lane Express*. From time to time, for many years now, have its columns dwelt on the abuses and incapabilities of Smithfield. They spoke, too, for both consumer and producer—as the advocate of the latter more especially, for whose hopes and whose requirements we had naturally a direct sympathy. Beyond this, we have continued from the period the site was first determined on, to report step by step the progress of the new market; and in doing this, to give but a short time since a plan and very full description of it, as completed. It could be only superfluous, then, to take the reader over this ground again. If he was not there as a holiday visitor on Wednesday, or if he will not soon find his way to it as a matter of business, the New Cattle Market will be always worth seeing, even amongst the "sights" of London, in which, for perfection of plan and detail, it must take high rank.

We say this advisedly. In the thousand or so of invited guests we met here, there were many of those who will furnish from their herds and flocks the chief attractions of the new market. In the crowds of common councilmen, country mayors, and market salesmen, we soon found the agriculturist and breeder had not been forgotten. In one place the still stalwart form of Jonas Webb, with all his blushing honours fresh upon him, and full of his visit to the French capital—there Mr. Hudson, of Castleacre, making for his seat at the banquet table in his usually quiet way. At another point we have a knot of noble lords—Yarborough, Portman, and Berners—all with a strong interest in the scene before them; and further on, the white hat and well-known features of Mr. Mechi, quite at home as a citizen farmer, and even with something still new to talk about, as the embryo member for Maldon. Close by, too, is a real member of Parliament, Mr. Christopher, backed by as real a Lincolnshire man, William Torr, "of Riby," as people still call him. On the other side passes my Lord Feversham, pleased to note how well his choice shorthorns will be cared for—and here, again, bustles along Mr. Jonas, of Ickleton, determined to see all there is to see—There the elder Garrett—Heath, from Norfolk, as some earnest for the Herefords.—Agriculture, after all, is well represented, although we fancy many others who were bidden could not come. The very sheriff of London, however, as he drives up in his grand carriage, and steps forth in all the dignity of chain and toga, is found to be a kindred spirit. Sir Henry Muggeridge is in no way out of place. He, too, has some interest in agriculture; although, when we are selling our cattle at Camden Town, he will be buying our corn in Mark Lane.

From all these, we repeat, the opinion was the

same. The new market was very generally approved: that in the extent of its business, so far from falling off, it will soon eclipse Smithfield we have very little doubt. Many who never sent a beast there, have already promised their support, when they see there is an opportunity of their being fairly dealt with. With more space as more space is wanted, and with railway convenience that will but too readily accommodate its uses to the requirements of time and place, it would be hard to say where the advantages of this new market will end, or how far its influence will be felt.

We refer to another column for the address presented to the Prince, with his reply to it. His Royal Highness went carefully through the whole range of buildings, and added his approval as to the completeness of the arrangements. As for the feast which he subsequently honoured with his presence, and at which he delivered one of those little speeches with all that excellent taste for which Prince Albert is deservedly famed—for this we can only say it was worthy of the City of London. A marquee, in which there was ample room and good ventilation; tables attractively furnished with all that in fish, flesh, and fowl could be brought to eat well when cold; and champagne-corks that rose hydra-headed on the fall of "a dead man"—all this associated with flowers and music, that by no means interfered with the more serious business of the occasion, left little to cavil at. Whether we regard the new market itself, or the festival which celebrated its opening, we repeat that it has been well done. However much we may have been prone to quarrel with the City authorities for their tardiness, we can now but give credit where credit is due.

The ceremonial of opening the new Metropolitan Cattle Market in Copenhagen Fields took place on Wednesday, under the immediate auspices of Prince Albert. The buildings constructed as a substitute for Smithfield are as much superior in accommodation as they are in position to that old nuisance; and the arrangements are highly spoken of on all sides.

The ceremonial of the opening was of a simple description. Prince Albert, arriving soon after one o'clock, was received by the Lord Mayor; whom he took into his carriage. After a drive round the market-place, the party assembled in a great tent; and Prince Albert, sitting on a raised platform, received the following address, read by the Recorder:—

"TO HIS ROYAL HIGHNESS PRINCE ALBERT, ETC.

"May it please your Royal Highness,—We, her Majesty's dutiful and loyal subjects, the Lord Mayor, Aldermen, and Commissioners of the city of London, in Common Council assembled, desire, by the warmest expression of our gratitude, to testify to your Royal Highness the value which we attribute to your gracious presence on this occasion.

"The proceedings of this day are of deep interest and importance to the great community of the metropolis and to the country at large.

"These costly and extensive works have been undertaken by the corporation of the city of London in deference to the suggestions of the national Legislature, and under a strong sense of the responsibility accompanying the powers and the means confided to them by their fellow-citizens.

"If the transfer of the City Metropolitan Market to the new and spacious locality shall be successful, it will not only have removed all ground of complaint arising from the character of its ancient site, but will also have conferred essential benefit on the population of this vast capital as well as on those important branches of our national industry which are concerned in supplying with food the increasing masses of its inhabitants and the countless numbers who frequent it.

"In the happiness and prosperity of all classes of her Majesty's subjects your Royal Highness has always evinced the warmest and most active interest, and we know nothing more likely to secure success to this great undertaking than the sanction and encouragement afforded in its inauguration by the illustrious Consort of the Queen.

"We therefore humbly rejoice in the opportunity thus given us of welcoming your Royal Highness on this spot, of expressing our heartfelt gratitude for your Royal Highness's attendance, and of manifesting anew our affectionate and respectful attachment to the person and family of the beloved Sovereign of these realms."

To this address his Royal Highness made the following gracious reply:—

"My Lord Mayor and Gentlemen,—Accept the expression of my hearty thanks for your kind welcome, and for the gratifying assurance of your loyal and affectionate attachment to the Queen and her family. I have been much pleased by the opportunity which your kind invitation has afforded me, of seeing and admiring the great work which you this day open to the public—a work which not only deserves all admiration in itself, on account of the excellence of the arrangements and the magnificence of the design, but which will, I trust, be found eminently conducive to the comfort and health of the city of London. That its success will be commensurate with the spirit in which it has been undertaken and carried out I cannot doubt. A certain dislocation of habits and interests must inevitably attend the removal of the great city market from the site it has occupied for so many centuries; and this may possibly retard for the moment the fullest development of the undertaking; but any opposition arising from such causes will soon cease, and the farmers will, doubtless, soon learn to appreciate the boon thus conferred upon them by the London Corporation, in the increased facility which will be afforded to them for the transaction of their business, and the comparative security with which they will be enabled to bring up and display their valuable stock in the Great Metropolitan Cattle Market."

At the termination of these proceedings, luncheon was proceeded with, upwards of a thousand persons partaking of it. If the live stock were absent at the formal opening of the market, the consumers were there in great force, and on the occasion did ample justice to the good cheer provided by Messrs. Staples. From the subjoined list of names it will be seen that the company comprised many distinguished persons:—

Amongst those present were:—The Right Hon. Sir G. C. Lewis, Bart., M.P., Earl Spencer, the Marquis of Breadalbane, Viscount Monck, Viscount Duncan, the Hon. H. B. W. Brand, Lord Stanley of Alderley, Rear-Admiral Hon. M. F. F. Berkeley, Rear-Admiral Henry Eden, Captain Alexander Milne, Marquis of Salisbury, Lord Redesdale, Right Hon. W. G. Hayter, M.P., Mr. James Wilson, M.P., Hon. W. F.

Cowper, M.P., Mr. H. Waddington, Mr. John Masterman, M.P., the Solicitor-General, Hon. Frederick Byng, Mr. Robert Ellis, the Duke of Newcastle, the Marquis of Westminster, the Earl of Macclesfield, Earl Lonsdale, Earl Yarborough, Lord Berners, Lord Portman, Lord Feversham, Lord Southampton, Lord Wenlock, the Belgian Minister, the Bavarian Minister, the Sicilian Minister, the American Minister, the Prussian Minister, the Right Hon. Sir J. Pakington, Bart., M.P., Mr. R. A. Christopher, M.P., Mr. W. A. Mackinnon, M.P., Mr. W. Ormsby Gore, M.P., Sir E. Sherlock Gooch, Bart., M.P., Mr. Melville Portal, M.P., Mr. Edward Ball, M.P., Mr. T. W. Bramstone, M.P., Sir E. Filmer, Bart., M.P., Mr. W. Masters Smith, M.P., Hon. P. J. L. King, M.P., Mr. W. J. Evelyn, M.P., Mr. W. W. E. Wynne, M P., Mr. Fitzstephen French, M.P., Mr. W. A. Wilkinson, M.P., Sir W. Clay, Bart., M.P., Mr. C. S. Butler, M.P., the Right Hon. Sir B. Hall, Bart., M.P., Sir John V. Shelley, Bart., M.P., Mr. Apsley Pellatt, M.P., Mr. H. J. Knyvett, Mr. C. R. Fitzgerald, Mr. C. Erskine, Hon. A. Dillon, Mr. J. Everest, Mr. S. Redgrave; the Mayors of Exeter, Southampton, Plymouth, Tiverton, Southmolton, Torrington, Birmingham, Norwich, Leicester, Windsor, Ipswich, Colchester, Brighton, Lewes, Salisbury, Yarmouth, Lincoln, Northampton, Cambridge, Reading, Oxford, Eye, and the Lord Mayor of Dublin, &c.

These we gather from the official list; while we are also enabled to name the following, more directly connected with the real business of the scene:—Mr. Hudson, of Castleacre; Mr. Charles Neame, Selling, Kent; Mr. H. Everest, Temple, Rochester; Mr. Jeremiah Solomons, Little Brook, Dartford; Mr. Ambrose Ward, Burham, Kent; Mr. George Franks, Steward to the Earl of Darnley; Sir Ed. Filmer, M.P.; W. Smith, Esq., M.P.; Mr. Wm. Dray, Framlingham; Mr. Rogers, of Leicestershire; Mr. Rayner, of Ely; Mr. B. Bond, Norfolk; Mr. Reid, Norfolk; Mr. Druce, of Evesham, Oxford; Mr. Jonas Webb, of Babraham; Mr. W. Torr, Lincolnshire; Mr. Heath, Norfolk; Mr. Clayden, of Littlebury; Mr. Mechi, of Tiptree Hall; Mr. S. Jonas, of Ickleton, Cambridge; Mr. Sturgeon, of Grays; Mr. Garrett, of Suffolk. Amongst the attendance of Smithfield salesmen were Mr. Vorley, of Camden Villas; Mr. Weall; Mr. Starkey; Mr. Ealand; Mr. Mosman; Mr. Woodward; &c. Metropolitan Butchers: Mr. Chandler, Mr. Collingwood, Mr. Thos. Hatton, Mr. Prebble, Mr. Prentice, Mr. Lee, Mr. Holloway, Mr. Deputy Hicks, Mr. Giblett, Mr. Slater, Mr. Shirley, Mr. Brooke, and others. Graziers: Mr. Oldey, of Birmingham; Mr. Bridge, of Buttsbury, Essex; Messrs. Attenborough, of Huntingdonshire; Mr. Sharp, of Deeping Bank; Mr. Marryatt, of Thorney; Mr. Warsop; Mr. Whiting, of Thorney; Messrs. Mawby, of Bourne; Mr. Bird, of Yaxley, Huntingdon; Mr. John Laxton, of Mawby; Mr. Hunt, Deeping; Mr. Johnson, of Lincolnshire; Mr. J. M. Macquin, of Bedfordshire; Mr. John Aveling, of March, Cambridge; Mr. Thompson, of Ilford, Essex.

During luncheon three toasts were given and cordially received by the company. The first was, of course, "The Health of the Queen;" after which the Lord Mayor gave that of his Royal Highness Prince Albert, whom he thanked for his condescension in coming to open the new market—a noble undertaking which he hoped would be a benefit to the country.

His Royal Highness Prince ALBERT, in responding to the toast, said—My Lord Mayor, I have to thank you for the manner in which you have proposed my health; and you, gentlemen, for the very kind reception you have given to the toast. It has given me very great pleasure to have been able to accept the invitation of the Lord Mayor to be present at the opening of this splendid and useful market (cheers). I beg to assure him that the oftener he will invite me to be present on similar occasions the better I shall be pleased (loud cheers). Enterprises of the kind can only be undertaken by public bodies—only carried to success by public spirit (loud cheers). I hail the present instance as an earnest of your determination to accept the duties which your position has imposed on you, and as a proof that success will meet at all times a bold and conscientious execution of them (great cheering). I beg to propose the "Health of the Lord Mayor and Corporation of London, and Prosperity to the Metropolitan Cattle Market" (cheers).

The toast having been enthusiastically received, his Royal Highness immediately afterwards withdrew, and the proceedings terminated.

OPENING OF THE METROPOLITAN CATTLE MARKET.

On Friday, the 15th June, the Metropolitan Cattle Market was opened in the spacious inclosures, Copenhagen Fields, in terms of the notice of Her Majesty's Secretary of State, in the *London Gazette*, dated the first of this month (June). During the early part of the morning the weather was extremely cold and rainy; and in the afternoon, again, heavy showers fell. But independently of circumstances of this kind, the event passed off to the general satisfaction of the trade. Last Monday, after the market was closed, bills were placarded in every conspicuous place about Smithfield, containing a copy of the above notice, declaring Smithfield for ever closed as a cattle market, and that the new market would be opened on the 15th instant, as above.

On the 20th of November last, a ground sketch of the Metropolitan Cattle Market was given in the *Mark-lane Express*, to which we refer, and from which it will be seen that the whole area purchased by the Corporation comprises 75 acres. Of this, a square field of 15 acres has been appropriated to what is, strictly speaking, market purposes—stock being bought and sold within its grounds, and which has been technically termed "The Markets." In the centre stand the banking buildings, twelve in number, and clock-tower, the latter not yet finished. Four of these houses are occupied for other purposes than money-taking: viz., first, telegraph office; second, office of the clerk of the market; third, chemist and druggist, &c.; and the fourth, ready-made butchers' clothes; while a fifth is still occupied by the architect as an office for the clerk of the works. Railing for about 6,000 bullocks occupies the one half—that on the east side of the banks—and is termed the "Cattle Market," or "Bullock Market." Imme-

diately adjoining the banks, on the west side, is the "Sheep Market"—1,749 pens, capable of holding from 15 to 25 sheep each, according to size, or from 30,000 to 40,000; while two spacious buildings on the west side, each covering about an acre, are fitted up with rails and pens for a "Calf Market" and "Pig Market," capable of holding—the former 1,425 calves, and the latter 900 pigs. Between the markets and Maiden-lane on the west side, six acres have been fitted up for sheep-lairs; on the south side eight acres for bullock-lairs; with nearly nine acres more adjoining for a dead-meat market, with public and private slaughter-houses; roads occupy upwards of eleven acres; and the balance of the seventy-five acres (twenty-six) are in reserve for enlargements.

About 3 o'clock (A.M.) we entered the calf-market, when the first lot was being tied-up for sale. No other stock had yet entered the market-grounds; but the bleating of sheep and the bellowing of more calves was heard at no great distance, and both soon made their appearance. The morning was rainy, cold, and uncomfortable; but drovers are weatherproof to everything of the kind, and the noisy hubbub of filling the market soon became general, presenting a scene no less animated than interesting—one more easily imagined than described.

Calves, pigs, and very generally lambs from the metropolitan provinces are brought to their respective markets, and removed in carts, vans, and waggons, which gives to them an interesting variety in more senses than one. Some of the country waggons, for example, have three storeys—or are "three-deckers"—very remarkable-looking vehicles when contrasted with the light strong dog-carts and spring vans of our princely butchers. One of them delivered some twenty-four calves in the calf-market; and then going to the sheep-market adjoining discharged the remainder of its cargo, consisting of twelve lambs from the lower deck, and a score of sheep from the upper. They are certainly, although rude, yet utilitarian conveyances, being simple of construction, and delivering stock in the best possible order; and when drawn by three horses "tandem," and accompanied by the farmer and his son in their "smock-frocks" and "wide-awakes" as horsemen, they give to the new market an air of Smithfield antiquity. They are thus formed:—A common waggon, in which the calves were placed, formed the middle storey; over this pens were placed for a score of sheep; while a small pen was swung below, of half the size. In bad weather a cloth is thrown over the whole, so that calves and lambs are delivered dry and comfortable. Long vans from Essex, again, are constructed for the express purpose of conveying calves, for which that county has long been famed.

In the filling of the market there was none of that obstruction experienced from vehicles of this kind, and conveyances in general, so much complained of in Smithfield; while butchers were able to remove their purchases with their light carts as fast as they made them. All branches of the trade must have felt sensible of the common benefits here enjoyed. It was the concourse of carts and waggons in the narrow streets and lanes, and limited area of Smithfield, which gave rise to so much confusion, cursing, swearing, and uproarious revelry, beneath the flickering glare of the lamps there, as to procure for the scene the epithet of "Pandemonium!" Nothing of this kind was here experienced, even with more than half the number of the gates of the market shut. On one or two occasions we no doubt observed a country cart standing in the way, in the calf-market, with its captivated care-taker gaping up in bewildered astonishment at the corrugated roofing, &c., and many similar examples of country youths doubtless escaped our notice throughout the day, in the different departments; but these are difficulties which will soon be got over, and even on the present occasion a word from the extra supply of policemen in attendance brought the rustic mind no less to a consciousness of its own duty than importance there.

In the calf and pig markets, the roadway in the centre is sunk below the floor of the lairs, so that calves and pigs are walked out and in, into the carts and waggons on level footing, the moment they are backed to the different alleys. These are all numbered, and as each carman knows his own number, he takes his cart or waggon to it, where he is sure to find his employer's salesman or master-drover, who takes his stock from him, gets him out of the way as soon as possible, so as to make room for another, or for butcher's carts taking delivery, thus rendering confusion impossible with any degree of attention.

The numbering of the alleys in each of the markets is a most important step towards order and regulation in the entering and removal of stock; and had the different gates also been numbered, and the ingress and egress to both made to correspond, the harmony would have still been greater, as it would have done away with all cross-purposes. The market police and salesmen's own drovers will no doubt find out the benefit of this in the course of time. On Friday, for example, bullocks were driven through the sheep-market, and sheep through the bullock-market, while butchers' boys with their carts took the straight way home from whatever point of the market they started, without regard to the inconvenience to which they subjected others. Compared with Smithfield, there was no doubt plenty of room to drive through the sheep and bullock markets to the gates on the east side; but the old saying that "the shortest road is not always the nearest" is here true, for had they left the market by the gates nearest them, into the broad open roads surrounding the market, they would have reached their destination in less time, and the proverb is applicable both in filling and emptying the market.

The work of the salesman's own drover is, as our readers are aware, to sort stock in the market, and grant delivery of sales as ordered. With the different marks of graziers and butchers he is familiar; so that when told whose stock are consigned for sale or are sold to whom, he at once knows the mark, and how to dispose of it. When a herd of bullocks arrive, for instance, in the market, he drafts out the different marks as fast as

his assistant drovers can tie up the bullocks to the rail; and the rapidity with which a herd of 100 head is sorted and placed ready for sale is hardly credible. The rails next the bank are 36 feet 9 inches long, forming, as it were, a stall of this width; and into one of these we saw twenty fine shorthorn and Hereford bullocks tied in a few minutes' time. In the sheep department, as soon as a flock arrives it is driven promiscuously into so many pens, so as to be out of the way of subsequent flocks, and afterwards sorted; and the same is the case with pigs. In short, the whole mode of management is that of Smithfield—the only difference being that there is here plenty of room in which to perform its antiquated and barbarous routine.

Shortly after the filling of the calf market commenced, sales and delivery to butchers took place; and up to nearly noon the work of filling and emptying were carried on simultaneously together—farmers' carts and butchers' carts backing to the lairs without the least confusion. In our ears the bellowing of the calves mingling with the bleating of sheep and lambs was deafening in the extreme; but on those of the trade it appeared to exercise a musical influence—the squeaking of pigs and bellowing of bulls and large oxen in the distance giving to the melo-drama a dulcet sweetness. How we should like to attend weekly we cannot say; but once is a treat, and we have no doubt that thousands of this great metropolis will enjoy it, now that visiting its cattle market has become a privilege without a life policy.

In the sheep market the commencement and progress of business was similar to that above, the trade appearing to be as much at home as in Smithfield, and free from a vast amount of annoyance there experienced for the want of space.

Pigs were longer in making their appearance; but sales commenced immediately on their arrival. The sorting and removal of them is always attended with a loud amount of grumbling; and no exception from this rule was experienced on the present occasion. The floor of their pens is made slanting, so that they lay at ease, without any risk of suffocation; but they were not sent here to lie long at ease, and the squeaking continued accordingly.

A fine herd of bullocks, consigned to Mr. Neve, salesman, Norfolk, was the first that entered the cattle-market, and was not long until part was purchased by Mr. Wm. Bee, of Newgate Market, and paid for to the Messrs. Hill and Son, bankers; and one fine bullock taken to the public slaughter-houses, and slaughtered by Mr. W. T. Farey, of the Ram, Smithfield; so that the bullock may be said to have been the first entered for sale, the first sold, the first bought, the first paid for, the first delivered, the first removed, and the first slaughtered in the slaughter-houses of the new market. The ox was fattened and consigned by Mr. More, Neatshead, Norwich, Norfolk.

A little before noon, cows were entered at the north-east corner of the cattle-market allotted for them, when sales were immediately commenced; and at two o'clock P.M., the horse-market commenced at the opposite or south-eastern corner.

The trade generally expressed themselves favourably towards the first day of the new market. The great distance from Newgate was frequently alluded to, and no doubt will be felt; but were either the dead-meat market removed to the live-stock, or a railway constructed to join the two, so that season-tickets could be had, objections of this kind would be greatly removed: and something of this sort must obviously be done.

The concourse of butchers' carts was immense; so that the relief in the neighbourhood of Smithfield must have already been great—and without, as far as we have heard, creating any annoyance in the neighbourhood of the new market or elsewhere.

The number of stock is published every market day in the window of the office of Mr. Shank, the clerk of the market, No. 9, Bank-buildings; so that any stranger can ascertain at a glance from the outside what the supplies are, and how prices are likely to rule. On Monday, for example, at seven o'clock, the numbers stood thus: Beasts 4,026, and sheep 23,050. It is seldom that members of the trade require information from this source; for, although strangers to the new market on Friday, they yet knew the moment they cast their eyes across it that the supply was under an average, and the attendance of buyers large; hence the result, which will be found reported in another column.

The large attendance on Friday, with the fact that the two principal hotels of the market are not yet opened, rendered the others crowded to overflowing, especially the two on the west side of the market, viz., "The Lion" tavern and "Black Bull," the landlords of which have long enjoyed an established reputation in Smithfield. To-day (Monday) the two on the opposite side, "The Lamb Hotel" and "White Horse" have also more than enough to do to accommodate their customers; and when once the thoroughfares on the north-east side, now being opened, are better known to the butchers of the city and eastern division of the capital, and the other improvements in progress and in contemplation carried out, it is more than probable that they will command a respectable share of the trade, especially the former, the landlord of which is also from Smithfield, and whose hotel, stock, and stabling are of the first quality and style.

For Friday, the market lairs were not very liberally patronised; but on the evening of that day some fine lots arrived from the North for the Monday market, while fresh arrivals swelled the number by almost every train on Saturday, so that, considering the change of the market site and season of the year, and want of experience, the Corporation, we presume, are satisfied with this part of the experiment.

On Monday the filling of the market commenced with the first of that day—stock leaving the lairs as soon as Sunday was over. This morning was fine, with a pure keen air, and from the market-grounds being beautifully lighted with gas, nothing could exceed the brilliancy of the scene at this time. How different from the dungeon-gloom and polluted atmosphere of Smithfield! On

Friday the tying-up of calves was the first and most attractive work for some time, but to-day the cattle and sheep markets take the precedence. Up to seven o'clock the work of tying-up bullocks and penning sheep proceeded with the greatest regularity and speed; some of the master-drovers in the cattle market by this time having sorted no fewer than 300 head. The supply was fair both as to quality, weight, and number; and about 8 o'clock (a.m.) a scene of greater grandeur never presented itself to the eye of a farmer or butcher than that which was to be seen from the balconies of the Lamb Hotel, one which we hope our metropolitan artists will do justice to. Our readers are, doubtless, aware that the Caffres and Hottentots train their bullocks to fight their battles for them; and here some 4,000 strong stood, rank and file, like as many soldiers, ready to fight the Emperor of all the Russias, the common enemy no less of the world than their country; and in their ranks they stood with as much regularity as ever did Her Majesty's Guards in Hyde Park on a review day. And they will even bear a closer investigation than from the balconies of the market hotels; for long before five o'clock curry-combs and brushes were as active as in any livery-stable, shewing off "rounds," "rump-steaks," and "barons" to the best advantage. On the part of salesmen and their own drovers there is no time sacrificed here, every moment being devoted to the interest of their employers; and the increased facilities now at their disposal in the new market are already handled accordingly.

The routine of sales and removal is similar to what we mentioned on Friday; the only difference in this respect being that the absence of old cows and horses gives to the Monday market a more respectable appearance, while the superiority of quality and increase of supply give to the trade a more stirring and active vitality, more especially when stocks on hand are small and supply rather under an average, as is the case to-day.

"One fact is worth a thousand opinions;" and in order to give our readers a just idea of the amount of business done here by individuals, we may just mention that in passing Bank No. 12 this morning at 7 o'clock, we met Mr. Slater, butcher to her Majesty, and, after making a brief apology, put the question: How much money have you paid to Alderman Challis? "£580," was the reply. Do you pay as much to every banker? (he was then going the round paying off his purchases). "That depends upon what they have against me!" Of course, we could not press for further details. Among salesmen, again, Mr. Nene shows upwards of 300 of the finest bullocks in the market, in one alley, opposite the Lamb Hotel; and nothing could exceed the splendid appearance which they had, when seen from the balcony of that hotel. Morgan, Jibblet, and one or two others, fall little short of this number. And the order and regularity presented in each alley prove the manner in which business was transacted. In making these distinctions, we must be understood as giving equal approbation to salesmen generally, whose conduct our limits will not allow us to individualize.

Smithfield market is now removed—the first metropolitan cattle market held for one week under the most auspicious circumstances, and reviewing the whole, the work, in a national sense, must be declared a great one—the commencement of a new era no less in the history of the Corporation than the trade. Looking back on Smithfield, there was certainly no branch of commerce in the British capital susceptible of greater improvement, and so far as gone, all interested appear anxious to put their shoulder to the wheel of progress, and doubtless will ultimately succeed in elevating the commerce of fat stock to that level which it is justly entitled to occupy in the metropolis. As yet, the regulations of the market are of an experimental character, thus affording to all parties an opportunity of suggesting to the Corporation whatever improvement appears to them worthy of adoption; and the trade are even publicly called upon, by bills posted up in every conspicuous place, to grant their assistance accordingly. And we have no doubt that the *Mark Lane Express*, as the principal cattle market paper in the kingdom, will not be found absent from its post in a national work of this kind—one of so much importance to the agricultural interest.

THE STEAM CULTIVATOR.

THE £200 PRIZE!!!

The most absorbing topic now before the agricultural world is steam cultivation. The liberal prize offered by the Royal Agricultural Society of England for the best steam cultivator has awakened great interest, which will be still more excited as the time approaches for its adjudication in July next, at the Carlisle Meeting. We hope and believe it will form one of the most interesting features of that Meeting; and as it appears destined to supersede both the plough and spade, the public will not be satisfied unless the various implements to be put into competition are subjected to the most comprehensive and severest tests, comprising, as it must, their applicability to every variety of soil and circumstance of cultivation, in order to prove their superiority to the plough or the spade.

It is not alone the best steam cultivator that is wanted, but a cultivator worthy of recommendation by that great society, as a substitute for that very ancient and long-established implement the plough,

and that still more ancient tool the spade; and to adjudicate aright on the comparative merits of these implements to perform the various works of tillage required from them, is the great question for decision. That of economy is secondary, and would ultimately be achieved; so that we shall undoubtedly have "an economical substitute for the plough or spade," if the efficiency of the implement itself can be fully proved.

The Spade.—The spade in the hands of a clever workman is of universal applicability for tillage purposes. It will "turn the soil" at any required depth designed by the workman, and he can further by its aid pulverize or comminute it to any given purpose or extent. Perhaps no implement, under such auspices, can execute all the desired works of tillage in such perfection as the spade. It turns the soil by complete inversion; it can throw up perfect trench-work; it can effect thorough subsoiling, together with all intermediate and ulterior processes: but all this mainly depends upon *the clever workmen*, and although it may be all done—"never so well done"—yet it is very expensive; so that we repeat, that if an efficient implement can be found, the question of economy will be secondary.

The Plough.—The plough, in all its phases and gradations, is a most useful and effective implement, and to find for it an efficient and economical substitute is no ordinary task. Its adaptation is all but universal for purposes of tillage. True, it cannot roll or harrow, but it prepares the soil for these processes with admirable facility and at little cost: neither can it so thoroughly invert the soil as is done by the spade; but its construction in variety is such that it is applicable to every kind of soil, and to every circumstance of culture. It will turn up the most retentive soils at great depth, and may with great equality in depth turn up the shallowest. Its trench-ploughing and common ploughing are admirably performed. It is a most useful implement for ridging for turnips, &c., for setting potatoes, for row culture generally, and the many other uses to which it is applied, and for which no cultivator could be made applicable—this it does by aid of horses and attendants, and at great cost unquestionably; so that here again we would say the question of economy is secondary.

The Cultivator.—"The steam cultivator that shall in the most efficient manner 'turn the soil' and be an economical substitute for the plough or spade," must then be a most effective, powerful, and comprehensive implement.

1. It must turn the soil in a manner equal to the almost perfect turning up of the spade, and far superior to the partial inversion of the soil as performed by the plough. This department of its work it must do in all its variations, from the roughest, "horse's-head"-sized clods to the finely-comminuted dust; thus providing for plentiful aëration, and completing the pulverization by its varied appliances or alterations in its machinery or working parts.

2. It must perform this work at every required depth as suited to all soils, and without injury to the land by pressure, more than equal to the tread of the horse. In this department of its work, it will necessarily be required to act as efficiently as the heavy-land plough for heavy lands, and to modify its powers to the requirements of light lands and soils of every kind, as well those abounding in stone as those of loose sand or gravel; in fact, to be equal to the plough in all its variations or adaptations, for every description of soil and its requirements for working it.

3. It must be qualified to travel over loose fallows, and perform the usual work of fallowing as commonly done by the plough, with equal efficiency and without greater pressure or consolidation than made by ploughing. Nor must it fail to cut up weeds and turn them on to the surface in an equal degree, not tearing or subdividing them injuriously, but leaving them in a proper state to be caught and brought up to the top by harrowing, &c., &c.

4. It must be able to dig or break up in a business-like and effective manner grass or seed lands; so that the sods may be sufficiently turned down to rot and decay, as done by the plough, and thus to prevent much labour in picking off and leaving much vegetable fibre below for the food for the growing plants.

5. It must be of a convenient and portable size, capable of ready adaptation to farm service; free from complication, either in machinery or arrangement of parts, and well suited to the management of an ordinary farm labourer.

6. The original cost must not exceed that of a proportionate number of farm horses, ploughs, and accoutrements, except inasmuch as the steam apparatus may be made applicable to other farm uses in which horses are not employed; neither must the cost of daily working exceed that proportion, except in the better performance of the work and the greater facility in its execution; *i.e.*, steam horses do not become weary.

These are some of the considerations which ought to influence the minds of the judges at the forthcoming meeting. I should hail the advent of a cheap and effective implement for steam culture as one of the greatest boons to agriculture, and I conscienciously believe its introduction is not very distant. However, come when it may, let us only sanction the invention which cannot fail to be practically efficient. P. F.

THE EXHIBITION OF AGRICULTULRAL STOCK IN PARIS IN CONNECTION WITH THE PALAIS DE L'INDUSTRIE.

"Unless you are a bird," as the Irish gentleman sagely remarked, "it is a hard thing to be in two places at once." Despite the implied possibility in the magic "we," this is often enough one of our own difficulties. It has been so upon a late occasion. The week before last came the great Agricultural Meeting at Tiverton, and contemporary with it the great Agricultural Exhibition in Paris. We use the term "great" advisedly, in application to either of these. With the exception only of the Royal Agricultural Society of England, we know of no more important gathering than that now annually held in the West of England. There is none that has progressed so rapidly or so favourably; and we can only repeat that "it is growing into another Royal Agricultural." We are pleased to think we did not miss its last celebration. Unfortunately, however, the Paris show was being celebrated just at the same time. In this strait, throwing over the comparatively short report received, we prefer to avail ourselves of the following very full particulars from an able cotemporary, *The North British Agriculturist*. In doing this, we have only a word or two more to offer. From what we can gather, the meeting for those who *were* present was very gratifying, and yet still more promising in its results. The exhibitors were fêted and complimented in the most gracious manner, while their stock was generally bought up at high prices. All this is very satisfactory. Still the experiment so far is not what it may be. As we said last week, the occasion excited anything but a general interest amongst our own farmers and breeders. We take this in some measure to arise from the imperfect manner in which the meeting was advertised in this country; backed, perhaps, by some dread of the unknown difficulties man and beast might encounter in their travels to the scene. The experience of those who did venture will go far to correct this, and to make the show of another year a yet more useful agent for that desirable intercommunication between the two countries.

It will be observed that Mr. Jonas Webb was unquestionably "the lion" of our English exhibitors. He received a special gold medal, had the honour of some interesting conversation with the Emperor himself on the breeding of sheep, and is to send a haunch of the famous Southdown mutton direct from Babraham to his Majesty. Our worthy cotemporary, in his zeal for the exhibitors, omits to mention one or two names that even "on hearsay" we can venture to compliment. First amongst these ranks Mr. Brandreth Gibbs, who, in inducing his friends to send their stock, and providing for them when they arrived, brought all his long experience of our own meetings into most excellent use. Then, again, Mr. Milward and Mr. Fisher Hobbs were selected from the Royal Agricultural deputation as Judges of the Poultry—a business for which it would seem they were better qualified, or at least gave far more general satisfaction, than attended some of the decisions in the classes of animals. In these latter there was evidently something wrong.

The exhibition of stock, which took place last week in the Champs de Mars, Paris, was crowned with complete success. Not only were those more directly interested in agriculture pleased and instructed by the concourse of animals of various breeds indigenous and foreign to France, but the public generally were highly delighted with the novelty and picturesqueness of the scene. The numbers who visited the show-yard during the four days in which it was open to the public were frequently so great that there was often some difficulty in obtaining even a glimpse of the prize animals. The interest appeared to be pretty equally divided between the breeds indigenous to France and those which had been brought from the mountains of Switzerland or from the fertile plains of England. The strangers, previously unacquainted with the native breeds of cattle of the country, appeared generally to be much struck with the merits of many of the animals exhibited, while those more familiar with them appeared to scrutinise them with apparent delight.

The show-yard presented a gay appearance. The taste displayed in the arrangements—the combining of trees, flowers, and fountains for effect—the number of well-dressed individuals—with the commingling of colours of the bright tints of the ladies' summer dresses—the rows of trees, partially shading the show-yard from the bright sunshine—the whole presented a picture which will not soon be effaced from the memory of those, especially of strangers, who witnessed the Exhibition.

The number of lots exhibited was about 1,200; and as some of the lots comprised several animals, the number of animals exhibited could not fall far short of 2,000. In giving a description of these, we will take the different classes in the order of the catalogue.

The Durhams (shorthorns) were arranged in various classes, foreign and native exhibitors being classed separately. Several very superior animals were shown. The first prize bulls, cows, and heifers were fine specimens of the Durham breed—the majority of the animals competing having had previously successfully competed at local shows, and were favourable specimens of the Durham. Some animals, however, were entered more with the view of effecting a sale than from the hope of their being successful as prize takers.

DURHAMS—MALES.

CLASS 1.—Males under two years.

There were 7 competitors.

1st Prize—Gained by the Marquis de Talhouet. Breeder, Mr. R. Stratton, Wiltshire.

2d Prize—Mr. Stewart Marjoribanks. Breeder, exposer.

3d Prize—Mr. Boutton, Leveque. Breeder, Mr. Towneley.

CLASS 2.—Males above two years.

There were 16 competitors.

1st Prize—Lord Feversham. Breeder, the late Earl Ducie.

2d Prize—Mr. Chrisp. Breeder, exposer.

3d Prize—Lord Talbot. Breeder, Mr. Chrisp.

4th Prize—R. Stratton. Breeder, exposer.

5th Prize—Prince Albert. Breeder, Mr. Fawkes, Yorkshire.

The following is the girth and length of three bulls—

1st Prize bull, age 26 months. The four front teeth quite up, and mouth that of a 38 months old animal. There is no doubt, however, but that he is correctly entered.

1st Prize—age 26 months—Girth, 7 feet 10 inches.
Length, 5 „ 8 „

2d Prize—age 41 months—Girth, 8 „ 4 „
Length, 5 „ 8 „

3d Prize—age 84 months—Girth, 8 „ 9 „
Length, 5 „ 10 „

The latter is the first prize bull of 1853, at Lewes, Perth, &c.

DURHAMS—FEMALES.

Females under two years.

There were 7 competitors.

1st Prize—T. Ball, Ireland.

2d Prize—Comte d'Aspremont, Belgium. Breeder, Mr. Emmerson, Yorkshire.

3d Prize—Prince Albert.

The latter was but an indifferent animal, and there were other heifers passed over decidedly superior.

Females above two years.

There were 16 competitors.

1st Prize—R. Stratton, Wiltshire. Bred by exposer.

2nd Prize—T. Ball, Ireland. Breeder, Mr. John Turner, Ireland.

3d Prize—Marquis de Talhouet. Breeder, Mr. Stratton.

4th Prize—Mr. Cartwright, Lincolnshire. Breeder, Mr. Topham, Lincolnshire.

In the class of females above 2 years old, T. Ball exhibited the best animal, but the judges, after deciding in her favour, found her disqualified from competing, they finding, by inquiring from the care-takers, that she had produced a live calf in March last, but was allowed to become dry. Thus, the judges committed a grave error in framing rules as to competition, and afterwards deciding upon such rules. Had the animal been kept in a semi-state of milk, or if she had not produced at all, she would, according to their rule, have been found qualified, and so placed first. Mr. Ball, by not protesting, was guilty, along with the judges, in this act of injustice, which will doubtless lead to future misunderstandings.

Of Durhams pure, bred in France, there were 18 competitors in the male class, and 11 competitors in the female class. There were also some very superior animals, bulls and cows, exhibited as extra stock, from the Imperial breeding establishment in Mayenne. The value of the prizes was considerable. There were, for males, prizes of from 1,000 francs to 600 francs, and for females from 700 francs to 400 francs. For sheep, for males from 600 francs to 400 francs, and for females smaller premiums. Besides several classes of prizes for pigs, there were for poultry prizes of 100 francs, down to 20 francs. There were about three hundred prizes and *mention honorable* awarded. Of these, there were awarded to competitors from England and Scotland nearly sixty, they carrying off nearly all the premiums for Durhams, Herefords, and Devons; of sheep, carrying off all the Leicester, Cotswolds, and a considerable proportion of Southdowns. Of pigs, they also carried off several of the prizes. The same as to poultry.

HEREFORD CATTLE.

Of the Herefords, the quality of the stock was superior to any previous exhibition that we have attended; all the prize animals being most extraordinary specimens as to quality of flesh, and generally of full sizes. Lord Berwick obtained the first prize, and *mention tres honorable* for another animal. The third prize for the bulls was gained by Vicomte de Curzay. The prizes for cows were obtained by Messrs. Perry and Walker.

DEVONS, SUSSEX, &c.

All very superior in both breeds.

The first-prize bull was small, and rather light in the hind-quarter; inferior to the one placed second. Of the cows the first prize was small, defective in the fore-quarter, and every way inferior to the second prize. First prize to Prince Albert, the second to Mr. Farthing. Considerable disaffection was expressed by Englishmen as to this decision, as well as that of the Shorthorn classes. The Emperor, Napoleon III., purchased two beautiful heifers from Mr. G. Turner, got by the first-prize bull: price said to have been handsome. Two Sussex cows in this class were sold for beef, at £25 each; and another very large animal sold for about £40.

AYRSHIRE, ALDERNEY, SCOTCH, &c.

The first prize was awarded to Lord Talbot—polled Angus bull, got by Mr. Watson's (of Keillor) celebrated bull Jock. There was an indifferent show of Ayrshires: the number of cows considerable. The first prize was a beautiful specimen, but rather undersized: the others exhibited did not produce a favourable impression as to the Ayrshire breed.

The Emperor exhibited three Ayrshires as extra stock. One of these, a heifer, was a beautiful creature, and would be difficult to beat if exhibited in Ayrshire in a class for heifers. Several of the Imperial establishment had cattle as extra stock exhibited; the most of these cattle were crosses between the Devon or Ayrshire with native breeds.

HOLLAND BREED.

Of the Dutch cattle there were few animals of even ordinary merit exhibited. Better specimens are frequently to be seen in Smithfield market. Those who have supposed that the shorthorn came originally from Holland, were certainly not acquainted with the breeds of cattle which are to be found in that and adjoining countries.

FRIBOURG.

This breed, which extends over several of the Swiss cantons, is characterized by a bulkiness of frame, with a thickness of bone, which appears surprising. Colour, brown or black, with large patches of white, face and back generally white. Some of them bear a likeness to the old herd of cows in Scotland, with faces white. Burns, in the "Cottars' Saturday Night," so describes his father's cow. It is a curious fact, and one we have not seen observed, that the Swiss bear a most striking likeness to the rural population of Scotland. In personal appearance and in expression of countenance the resemblance was so remarkable that we could not divest ourselves of the impression, when in the showyard, that we must have met the same individuals in Scotland, in markets, and elsewhere, who

had charge of the Fribourg and Schwitz cattle. The history of the countries is nearly similar, and both have had to fight out their own position. Are they sprung from the same stock, or has their training produced this striking resemblance? The Fribourg breed are fully larger than any native breed of the United Kingdom, not very level on top, but evidently good milkers. They have a mildness and gentleness in their expression which speaks in unmistakeable language that they are upon very intimate terms with their owners.

SCHWITZ.

This remarkable breed as milk producers are generally alike in colour, being of a dark dun brown, with the under parts of a lighter colour approaching to fawn or yellow. The price asked by the owners for both of these Swiss breeds was fully double what they would have realized in our markets, that is, if valued as ordinary dairy cows. This breed, like the Fribourg, has eyes so expressive that those who do not place cows very high in the scale of animated nature, would do well to study. "Ox-eyed Juno" can be understood when looking at the mild eye of the Schwitz cow.

As the breeds indigenous to France were fully described last year, we do not deem it necessary to return to them, remarking only that several of the more interesting specimens of the breed were absent, and the most beautiful of all, the Charolais, were not in at all the same numbers, nor such large and handsome animals exhibited. We formerly expressed an opinion that this breed must have been introduced by the Roman into France. They are so like the shorthorn that they may be almost classed as nearly allied breeds. The same remarks hold true as to the indifferent show of French sheep, the Merino excepted. The indigenous breeds of sheep in France must in time give place to other breeds. The same with reference to the pigs. The native breeds are not only offensively ugly, but are often positively dangerous. The French are becoming every day more impressed with the value of the improved English breed of pigs.

Of the Leicesters and Cotswolds the show was good. The Leicester sheep were of good sizes, *and all the prize sheep had dun faces and legs, some of them spotted,* and could with no great stretch of fancy be classed as a cross between Leicester and Down sheep. The Cotswolds were remarkably fine animals. The flock of Mr. B. Browne, Gloucestershire, who furnished the majority of those taking prizes, should be examined by those desirous of becoming acquainted with this valuable breed.

Of the Southdowns the exhibition was superb as regards the tups; the ewes were not so well brought out. The whole of the tups exhibited by Messrs. Jonas Webb, Ellman, and Rigden were creditable to their breeders. Mr. Jonas Webb sold about fifty to be forwarded from England, and at very high figures. The Emperor, who visited the show-yard on the afternoon of Thursday, conversed for a few minutes with Mr. Webb, admiring the symmetry of the prize tup. His Majesty asked Mr. Webb if the wool of the Southdown was as fine as the animal was beautiful. Upon Mr. Webb assuring him as to the superior quality of the wool, his Majesty next questioned Mr. Webb as to the quality of the mutton. Mr. Webb's reply was, that if his Majesty would be pleased to accept of a haunch of mutton at Christmas, he would be happy to send him one, so as to enable him to judge as to the quality. His Majesty in answer, said, he would be happy to accept of the present. Mr. Webb afterwards through the Minister of Agriculture, made a present of the prize tup to the Emperor, which his Majesty, we understand, was pleased to accept. This proceeding on the part of Mr. Jonas Webb will be fully appreciated by those who know the value of his prize sheep. Mr. Webb has been now thirty-three years a breeder of Southdowns, and has had twenty-nine sales. The average price has been gradually advancing, which shows the estimation in which he is held as a breeder. He sells annually near to four hundred tups.

The competition among the pigs was well sustained. Some disappointment was felt that one sow was disqualified, from the idea that she was overfat for breeding. The whole of the English pigs were in nearly the same plethoric state—the chief merit of these improved breeds.

In poultry there was little competition. The best pens were easily selected. The great proportion of those which received prizes were good specimens of the respective breeds. The geese were all inferior. The Rouen ducks very fine. Of fancy pheasants there were several pens, and also of fancy geese. The display of pigeons was meagre as to numbers, and some were curiously classed, the common carrier pigeon being marked as the carrier pigeon of Ireland. Of rabbits there was also little deserving of commendation. The exhibition of goats was interesting from the curious breeds congregated. Of these, one pair from Mont Blanc had horns fully three feet long, and thick in proportion; the points are turned backward, or the animal could not carry its own weapons of defence—formidable enough if the animal is naturally courageous. The beautiful goats from Cashmere, as well as some others, attracted many admirers.

The distribution of the prizes took place in a pavilion erected for the occasion. This *salle*, decorated with national ensigns, had the British ensign always complimentarily placed in connection with the Turkish and French flags. The arrangements were nearly the same as those of last season, but fell short in the grouping of objects and general decoration to the *salle* of last season. The successful competitors, with their servants, were requested to be present in their places in the pavilion before two o'clock; shortly after which hour the Minister of Agriculture, accompanied by the Directors and jury, entered. After a complimentary speech by the Minister as to the merits of the animals exhibited, the list of prizes was read over by M. M. Tisserant, and upon the names of the different successful competitors being read, they walked to the dais at which the Minister and jury were seated, and received their ticket entitling them to the prize. The first name called was that of Lord Feversham, and he was cheered. The rest of the English, Dutch, and Swiss prize takers were also received in the same kind manner. Mr. Jonas Webb was called upon so often that the reception he received towards the close was quite enthusiastic. A special medal of large size is to be struck for this worthy representative of the English farmer. One very young lady of a pretty blonde complexion was also loudly cheered. The most interesting part of the ceremony was, however, that where the servants received their prizes. The honest blunt English shepherds approached the dais for medals. These are of silver, and beautifully carved, having upon one side the likeness of the Emperor, &c.

During the distribution of the prizes which occupied upwards of two hours, an excellent military band enlivened the proceedings by playing national airs. When the name of Prince Albert was announced as a successful competitor, the band gave "God save the Queen," the whole company standing. After these proceedings had terminated, the Emperor entered the showyard, and was conducted by the Minister of agriculture, accompanied by some of the officials in connexion with the concourse, walking leisurely and looking somewhat pensive. His Majesty remained about one hour,

going through the different rows of sheds, looking at the different animals, as his attention was directed to them. Almost at the same time as the Emperor left the showyard, the Empress entered, remaining in the carriage which was open, and which was driven slowly through between the different rows of sheds. Her Majesty chatted familiarly with one or two ladies whom she recognized in the crowd; shaking hands with an elderly person in the most affable manner. The reception her Majesty received was cordial, as was also that of the Emperor. Her Majesty returned the expressions of esteem by a gentle inclination of the head. The Emperor was more reserved, only occasionally taking off his hat and bowing to the people.

The demand for English stock was, upon the whole, good; and very fair prices given for good animals, for breeding. Indeed, it may be questioned if there were ever as many animals sold at any meeting of the National Societies in the United Kingdom, and at as good prices. The shorthorns were in most demand, and for all animals suitable for breeding the prices were good. Mr. T. Ball, Ireland, sold the three heifers he exhibited at the average price of £120, the best being sold for £160. Several of the bulls were not for sale; and one or two were only fit for the flesher, and little more than their value to the butcher was obtained. Nearly all the Herefords and Devons were sold. The best ram of the Cotswold breed was sold to a French nobleman for £30; the three first prize ewes for £20, they returning into Kent. Tups of average quality brought from £10 to £20. Several of the best Leicester sheep were not sold, partly from the high price asked and partly that some were not for sale.

The prices asked for the Fribourg and Schwitz cattle were fully equal to that demanded for shorthorns. As much as £68 was refused for an indifferent bull of the Fribourg breed, and he was again taken back to Geneva. Two cows from the same district were purchased by a small proprietor within six miles of Paris for £31 each, and these were considered a bargain. Higher prices were refused for Cows of the Schwitz breed, and many of these were taken back to Switzerland, a distance of about 600 miles; and this these cows had accomplished on foot, shod, of course, but active, and not apparently injured by the journey. They are structurally well adapted for travelling.

The pigs were in great demand, scarcely one animal returning to England. The first prize boar, of the small breed, was sold for £45. The same price was obtained for the first prize show. Mr. G. Jesty, Woodlands, Surrey, sold a sow for £19; and an indifferent boar pig for £8.

At the public sale of stock which took place on Friday and Saturday, the demand was less active than by private sale. The charge of two francs for entry for sale was returned to foreign exhibitors. Thus, everything was done by the Government to remove all source of complaint or disaffection.

The whole of the expenses of transit of the stock, or expenses incurred otherwise, have been repaid by the French Government to those exhibitors who made application, and some rather extravagant charges have been so refunded.

The whole outlay of the French Government is estimated as amounting to 300,000 francs; the great proportion of which was expended in premiums.

The arrangements of the exhibition were, upon the whole, highly commendable. Some dissatisfaction has been felt in the North of Scotland that a class had not been made for the Polled breeds of Scotland. Those disappointed should consider these breeds, however well known in Scotland, and in some parts of England, are wholly unknown, even by name, in France. And again, if it was thought so advisable that a class of premiums should have been offered expressly for this breed, a proper representation ought to have been made in time to the Minister of Agriculture. How this should have been made—whether through the Highland Society, provided they would have entertained the idea, or through the Northern Society, or by a few breeders themselves, remains with those taking an interest in the subject to decide. We understand that, for the exhibition of next year, the Minister of Agriculture is ready to receive any representations as to the merits of these peculiar breeds hitherto unknown in France, and but for Lord Talbot would have been still unknown, so far as any exertion was required in exhibiting a few good specimens of the Polled breeds. The breeders of the West Highlander should also bestir themselves, as there are districts in France upon which this breed could be advantageously placed. But without some such movement on the part of farmers in Scotland they surely cannot expect Government officials in France to make themselves acquainted with all the merits or supposed merits of breeds not indigenous to, or known in France.

With reference to the arrangements within the show-yard, there was little to find fault with, while there was much calling for commendation. The sheds were placed parallel with one another, with the exception of those where the placing of the stock required them to be run at right angles. The construction of the shedding, with the light and simple roofing of wood, with a covering of canvas, should be copied by those having the charge of constructing such erections. The expense of the shedding in the Champs de Mars would be under one-half of that expended upon the same shed in England or Scotland.

From the catalogue containing a sketch of the show-ground, with the places in which the different breeds were placed marked, a visitor was at once enabled to make his way to the stock he wished to inspect. These catalogues, which were sold for half a franc (fivepence), presented a strange contrast with arrangements at home. The catalogue is double the bulk and contains quadruple the matter of an ordinary catalogue of the Highland Society's Exhibition.

The necessity of interpreters was avoided by there being two gentlemen acquainted with the English, German, and Dutch languages appointed to take charge of the foreign department of exhibitors. The civility, attention, and anxiety to anticipate the wishes of the exhibitors by these gentlemen called forth one unqualified expression of gratitude from the various exhibitors.

The two Commissaires for the foreign department were M.M. Tisserant and Radouant. M. Tisserant, during his residence in Aberdeenshire, made many personal friends; and to them, as well as others to whom he is personally known in Scotland, no less could be expected from him. During the nine days of the exhibition he was unremitting in his duties, spending not only the whole day in the show-yard, but part of the night. It is to be hoped that the English exhibitors will take some steps to mark their sense of the services rendered to them by M. Tisserant. Had the subject been but suggested in the show-yard, it would at once have been liberally responded to.

Of the attention bestowed upon foreign exhibitors and other gentlemen connected with the deputation from the three national societies in the United Kingdom, it is impossible to speak in too high terms. Fêted night after night by such gentlemen as the Count de Grouchy and the Minister of Agriculture, invited by the French noblesse to country residences to view their estates; in public and in private the urbanity

and politeness of the French were conspicuous, and few who witnessed the proceedings will forget their visit to the French National Agricultural Exhibition of 1855.

We have been requested to state that a roan shorthorn bull, 2 yrs. and 2 months old, which competed in the 1st class, 2nd sec., the property of R. I. Westbrook Baker, Esq., of Cottesmore, although no prize was awarded to him, was sold for 2,250 f. (90*l.*) to M. Auclerc, Constant President of the Agricultural Society of St. Amand. The quality of this animal was much admired.

THE WHEAT TRADE.

No. I.

Dear Sir,—My last communication on the above important subject, was dated the 20th Sept., 1854, at which period the uncertainty hanging over our prospects of a supply of wheat for the current year, was alleviated *only* by the conviction that our own crop, being unprecedentedly productive, would be sufficient for the year's consumption, whilst it would leave us nothing in reserve, except to the extent of what we should be able to import. It is probable that England has never been placed in so anomalous and critical a condition since the year 1800, in regard to the supply of bread-corn; for by the deficiency in the crop of 1853, and her utter inability to import a sufficient quantity from abroad to cover that deficiency, she was compelled to fall back upon, *and consume*, to the extent of five million quarters of the reserve stock, which is usually held over the harvest, to meet the contingency of a wet or damp season, which renders a mixture of old corn absolutely necessary in the manufacture of flour. Had the succeeding crop (1854) been also deficient, or even an ordinary average one, it is impossible to say what might have been the consequences, or to what height the price of wheat might have been run up. For, not only should we have immediately felt the exhaustion of the usual reserves; but, as it turned out, we should have had no means whatever of relief. This will be sufficiently clear if we consider that our foreign resources have this season failed us to such an extent, that with an ordinary crop it would have been impossible to meet the consumption.

For instance, in the United States, from whence our importations amount upon the average to about 800,000 quarters, the price of wheat and flour is at this time higher than in London; and agents from thence are actually purchasing Spanish flour (to be shipped in Spain) on Mark Lane, for the New York market. From the Black Sea, too, our supplies are wholly cut off for at least the next three or four months, whether we have peace or a continuance of the war. From France and the European ports of the Mediterranean, with the exception of Spain, we have had little or no supply since harvest; and until the next crop, they will have enough to do to hold their own. The bulk of our imports of wheat, therefore, have come from Egypt, Spain, and the Baltic ports: and to what have they amounted? Only 880,000 quarters in the six months from the 5th of September, 1854, to the 5th of March, 1855, against 3,100,000 quarters in the corresponding period of the previous season. This will tell, in some measure, what would have been the probable consequences to this kingdom of a deficient harvest; and we cannot be too thankful that such was not the case.

Be it observed, too, that this falling-off in the foreign supply has not arisen from lowness of price with us, or wholly on the contingency of war. In 1853-4, for instance, our high prices stimulated the export of wheat and flour from the United States to such a degree, that every barrel of the one, and bushel of the other, that could be conveyed to the seaboard, was shipped off to Europe. I suspected at the time that they were overdoing it, and would leave themselves too bare of stock; and such proved to be the case. A deficient harvest last year, found them totally unprepared, and the consequence is that flour is at this present time 10s. per barrel higher at New York than it is here; so that we can look for no further supplies from thence this season: and what is more, our Canadian supply is diverted to the United States as the best market. So that the whole of North America is, in respect to a supply of wheat or flour, as effectually shut against us as if we were at war with that continent.

And with respect to the Baltic ports, the same may, to a certain extent, be said of them: that the prices of last year in England and France stimulated export beyond its natural limits, to the exhaustion of the stocks. This we learn by evidence from Rostock and other northern ports; and if we are just now obtaining a tolerable supply from thence, it is the accumulated stock brought down by land during the winter months, whilst the navigation was stopped. And the same communication informs us that they cannot send us much more after the present shipments are despatched, until another harvest, especially if the Russian prohibitory ukase is strictly enforced in every part of that empire; otherwise we might expect a supply to reach Dantzic, Stettin, and Rostock from Rus-

sian Poland by the Vistula, and other rivers and their tributaries.

With regard to Spain, we are obtaining a small supply of wheat and flour from thence; but if we are to have the United States for a competitor, the quantity in future will be still more limited; whilst, however, our prices are so high, and only then, they will send us all they can spare, and probably something beyond it, unless a better market can be found for it. The difficulty in Spain—owing to the wretched state of the roads and the absence of canals and railways—in getting the produce to the seaboard, prevents them, in ordinary years, from exporting corn; so much, in fact, is the price of grain enhanced by the enormous expense of the transit by land, that, as I have before stated, the inhabitants of the coast find it more to their interest to import wheat and flour from the United States than to fetch it from Old Castile, where the first cost is frequently not more than 1s. 6d. per bushel. But when a high price can be obtained on importation, and then *only*, Spain can export a large quantity of wheat. We can, however, in the present instance, make no estimate whatever of the quantity to be obtained this season.

We must now turn to Egypt and her dependencies, from whence we may expect a considerable supply of wheat in a few weeks. In the Delta of the Nile they reap two harvests in the year; the first in March, and the second in September or October. The former is already over; and as the prices of Western Europe tempted the Egyptian farmers to sow more than usual, they will have a large quantity to export. On the other hand, the supplies from the Black Sea being cut off by the war, the Mediterranean islands, which depend upon the hard wheats from the Russian ports of that sea, will now be competitors to a large extent with us for Egyptian wheat. This will apply also to Turkey, which derives a large quantity of wheat from South-eastern Russia when at peace, as well as from her own Danubian provinces. Upon referring back to my letter of the 17th August, 1853, I find that out of about nine million quarters of wheat shipped at Odessa in six years, above six millions were sent to the Mediterranean ports, including Constantinople; whilst only one-fourth of the entire quantity came to the United Kingdom *direct*, and the small remainder to Northern Europe. This supply is now wholly cut off, as well as that from the Danubian provinces; and Egypt is the only country in the East from whence we can look for any considerable supply.

Under all these circumstances, and looking at the small amount of the imports the first six months of this season, I do not see how we shall be able to make up the year's importation beyond 2½ million quarters, which will be only sufficient to replace half the stock consumed last year, and will consequently leave us minus 2½ millions of the usual stock of old wheat on the eve of harvest. And this will be further reduced by the lateness of the season, it being almost certain that the harvest will be at least a fortnight or three weeks later than usual, which delay will be further increased from a week upwards by the shortening of the days. We must depend, for this season's consumption, wholly upon our own produce of wheat, and shall have but little of any kind to begin upon the next. Whether the supplies will be brought forward to market regularly will depend in some degree upon the opinion entertained by the farmers of the probable continuance of the war; and whether, *under any circumstances*, the price of wheat is likely to continue for any length of time at or near its present maximum. This, however, is a branch of the subject which must form the subject of a future letter. Yours faithfully,

London, May 26. S. C.

No. II.

Dear Sir,—I propose now to consider our prospects for the ensuing year; and in doing so, although I admit our situation is not so satisfactory as we could wish, I by no means coincide with your correspondent, "A Constant Reader," in his fears that "we are on the eve of famine," or that the condition in which we now find ourselves is "the consequence of free-trade;" and I can with the more propriety combat the latter opinion, from having myself been a zealous protectionist until I was fairly beaten out of it by reasoning, which has since been fully established by fact and experience; and unless your correspondent can shew that the partial failure of the crops of 1853, in England, France, and other countries of Europe, that of 1854 in the United States, and the war with Russia were *all* the effects of free-trade, I am bound to believe that a duty on wheat and other grain, whether fixed or on a sliding scale, would inevitably and indefinitely have increased the difficulties of our present situation.

Having thus noticed the alarming statement of your correspondent, I proceed to point out the most important features of our present condition, as bearing upon the prospect of the coming year. In my letter of the 25th ult., I endeavoured to show that it is probable we shall not have a surplus of more than two and a half million quarters of old wheat to commence with after the next harvest. Of the growing crop, the opinions given by various parties are so much at issue that it is impossible to reconcile them, so as to obtain a satisfactory conclusion. I therefore beg leave to form my own opinion on the subject, which is, that notwithstanding the partial injury sustained by the wheat crop on the light blowing lands, it is not more extensive, *in the aggregate*, than what takes place *every* year in one dis-

trict or another, and as was even the case last year; and that nothing has occurred hitherto to prevent us from having a full average crop of wheat, say a produce of sixteen millions in the United Kingdom. For if there has been a partial failure in the plant, there has been also an extension of the breadth sown, in consequence of the high price, which will more than compensate for the injury sustained up to the present time. This peculiarly applies to Ireland, where, as I am informed, every acre of land that could be prepared has been sown with wheat, so that we may expect a large supply from thence, should the crop turn out good. The Incumbered Estates' Court has made a great and important change in the occupancy of the land in that country, beneficial to all parties really interested in the soil; for in point of fact, the nominal owners of the estates derived the minimum of income from them. In some cases, the sale of the properties has been beneficial to them too; for they find themselves in possession of a larger income with the residue of their estates, after enough has been sold to discharge the incumbrances, than they derived from the whole. On the other hand, the capital thrown into the land by the transfer, and the additional skill and enterprise brought to bear upon agriculture by a more intelligent class of occupiers, will soon enable Ireland to supply England with increasing quantities of wheat annually. We may expect that, unless the season happens to be unfavourable to the wheat crop between this and harvest, that there will be a full average quantity of sixteen million quarters reaped in the United Kingdom.

We have, however, to provide for the year's consumption of twenty-one millions of quarters next year, which will require at least an importation of five millions, besides the two and a half millions, to replace the stock reduced in 1853-4 to make up that year's consumption. We must, therefore, look abroad to see what our neighbours can do for us, for on them we must certainly depend next year, as well as heretofore. With respect to those nations with whom we are at peace, if they have a surplus, they will be as ready to take our money as we shall be to take their corn; assuming, therefore, that next year will be an average one in regard to production in general, we may state the case as follows:—

First, America.—In that country, the combined facilities afforded by railroads, canals, and inland steam navigation are enabling the western states to convey their "breadstuffs" to the eastern seaboard, which in former years they were debarred from by the expenses attending land-carriage. The land in those states consists of immense undulating plains ("rolling prairie land"), without any trees to fell or grub up. It requires the smallest imaginable degree of culture to render it at once available. The soil of these "prairies" consists of a deep alluvium, rich and fertile, requiring, in fact, two or three crops of maize to be taken in order to reduce its raging fertility, and prepare it for wheat; after which, it may be sown with the latter grain for many consecutive years, without a diminution of produce or sensible exhaustion of its fertility. In this respect, the western states are entirely different from the eastern, where the soil is not only far inferior in fertility, but the labour of felling the forests is intense and tedious. The distance, however, of the western states from the shipping ports was a bar to exportation from thence, until the establishment of railways, which is now achieved; and those states are fast filling with emigrants from the east, and will be able in future to send us annually increasing quantities of every description of agricultural produce in the shape of corn. If the harvest in the United States turns out well this year, we shall probably obtain from thence and Canada at least two million quarters of wheat and flour, which is a larger quantity than we have ever yet obtained from that continent in any one year.

Secondly, The Northern Ports.—Under present circumstances we must exclude the Russian ports from our estimate of these, as well as those of the Black Sea; and if Russia enforces her ukase against the export of wheat throughout her dominions from whence it is possible to find its way to England, it will cut off a large portion of our supplies from the Baltic. A great part of the wheat granaried in the Prussian ports of Memel, Stettin, Rostock, Konigsberg, and Dantzic is brought down the Vistula, Niemen, &c., from Russian Poland; so that until we learn what course will be taken by the Russian Government in this respect, we can form no calculation of the quantity of wheat to come from the Baltic next season. Unless, however, the prohibition is peremptorily enforced, the Prussian merchants will be at liberty to purchase the wheat, and equally so to sell it to us, as neutrals. In that case the war will not take from us more than we usually obtain from the direct Russian ports—Archangel, Petersburg, Riga, &c.—which has not averaged above 51,000 qrs. per annum, leaving us an importation of from 1,500,000 qrs. to 2,000,000 qrs. from the other northern countries, including Hamburg and the Netherlands.

Whether, however, we obtain so large a quantity as that depends upon the competition we have to encounter. At the present time, for instance, we are importing a considerable quantity of wheat from the Baltic; but a portion of this will be re-exported to France, where the price is rapidly advancing; and buyers from thence are now in London, to purchase floating cargoes as they arrive. To what extent this may be carried it is impossible to say; but there is reason to believe that the want of wheat in that country is felt to a much greater extent than with us. Our own enormous growth and produce last season has enabled our farmers to supply the markets in the most plentiful and regular manner. At present there is no falling off; and although in some of the districts of the kingdom the farmers are said to have sold out their stock, there is no reason to think that this is a general or even a frequent case, or that we shall not continue to be well supplied with English wheat until the new crop is ready.

Thirdly.—From France it is not at all probable that we shall be able to import any wheat next season beyond an occasional surplus she may have of imported corn to spare us. Her stock of wheat was exhausted as well as

our own last year, and her crop was not nearly so productive as ours. It is impossible that there can be any considerable stock in that country at the close of the present season; and the French Government are too much alive to the danger it incurs, from allowing the price of bread to get too high, not to use every effort to prevent it. It is probable, therefore, that the prohibition to export wheat or flour *now in force* in that country will be continued or renewed next year, unless the return of peace gives a prospect of an abundant supply from the ports of the Black Sea. The same reasoning will also apply to Italy and Sicily, in which country the stocks of corn are exhausted. They have, in fact, but seldom any to spare for exportation, and certainly not this year.

Fourthly.—From Spain, as we showed in my last letter, we shall obtain a good deal of wheat and flour provided our prices are high enough. I cannot form any estimate of the quantity to be obtained from thence; but if the price sets in high with us after harvest, which I fully expect, she may probably spare us half a million qrs. during the season. This, however, is mere conjecture, based upon what we imported from thence in 1829-30, under the stimulus of high prices. Spain certainly could furnish us with an abundance of wheat from the interior; but agriculture is at a low ebb in that country, and the absence of railways is a bar to its improvement, there being no facilities for getting the produce to the seaports at a cheap or expeditious rate.

Fifthly, Egypt.—We may calculate on obtaining from that country from 750,000 qrs. to 1,000,000 qrs., unless there is a strong competition to contend with. The quantity exported from thence has rapidly increased, and the quality and condition greatly improved. Under the energetic government of the late and present Pasha, the agriculture of Egypt has been considered an object of the first importance, and every encouragement given to it; the beneficial effects of which are sensibly felt in the great increase of the exporting power.

From the Black Sea under present circumstances, we cannot hope to obtain any supply of wheat; at least whilst the Danube is shut against us by the occupation of the Russians of the left bank at its entrance. How far the operations of the Allies in the Sea of Azoff, and their command of the ports of Taganrog, Marionople, &c., will enable us to get a supply from Eastern Russia by the Don and other rivers, in spite of the prohibition, it is too early to say. We can therefore take no account of this source in our estimate, which is as follows:—

America ..... qrs.	2,000,000
Northern Europe, say	1,700,000
Spain	500,000
Egypt and its dependencies.....	750,000
Other places	850,000
Total.....	5,000,000

Such is the view I take of the probable state of the wheat trade the next season. Everything, however, depends upon the continuance of the war; and whatever opinion may be entertained to the contrary, it is possible that Russia may be better disposed to listen to reason when the Allies have followed up their recent successes by a successful attack on Sebastopol. Still, whatever may occur to prevent the continuance of the war, I have no idea that the price of wheat can be much lower next year than it is at present. I ground this opinion on the fact of the exhaustion of the stock throughout western and northern Europe and America, which *one season* of average abundance—and we cannot expect more—will hardly suffice to reinstate. I shall, however, in a future letter go more fully into this branch of the subject, And remain, yours faithfully,

June 1. S. C.

No. III.

Sir,—In my last letter on this subject, I endeavoured to show the extent to which our requirements of imported wheat would reach for the next season, and the probable sources from which we could obtain the supplies. Since it was written, the favourable change in the weather has put to the test the correctness of the reports respecting the injury sustained by the growing crops. From the accounts received from all parts of the country, as recorded in your journal and elsewhere, the opinion I then ventured to express is fully confirmed, namely, that the mischief is wholly confined to the light lands, and does not exceed the average of years, and that although a portion of such land has been ploughed up and resown, it is by no means equal in extent to the extra breadth of land under wheat, where the turnips were cleared off early for that purpose. On the other hand, it is universally admitted that on the strong lands there is everywhere a full plant; and that *on all soils*, nothing can exceed the healthy and vigorous appearance of the blade. The present weather, too, is unquestionably most favourable for the earing and flowering; and if it continues another fortnight, as we may reasonably expect it will, the "setting" of the grain will have been matured under the best conditions for securing a full ear and abundant produce.

We have therefore reason to hope that the coming wheat crop will be a full average one, amounting to sixteen million quarters for the United Kingdom. This will still involve the necessity of importation to the extent of five million quarters, to make up the year's consumption. I made an estimate, in my last letter, of the way in which this quantity is to be obtained. I admit that estimate to be an extreme one, in respect to amount, being based upon the assumption that the crops abroad will be abundant. Should it prove otherwise, there will be considerable difficulty in obtaining what we shall require for the year's consumption; in which case, prices would rule higher throughout the next season than they have the present one. But even should my hopes and estimates be realized to their full extent, I do not see a prospect of prices being much lower, if any, than at present. The exhausted state of the stocks of wheat all over Europe, and in America, will of itself have a material effect upon prices, and will also prevent the free export of wheat from many places.

From what I can learn from persons in the country, and on Mark-lane, the farmers, generally, have thrashed

out a great part of their wheat, and that portion which is not sold, lies on granary, and not in the straw. Their object undoubtedly in this, is to have it in readiness to take to market at any moment; and it is probable that if the weather continues favourable, the whole of last year's produce will have been taken into consumption before the new crop comes in; few of the farmers being disposed to hold over, or speculate upon better prices than the present ones. Already the country markets are far less plentifully supplied; and there is a stiffness in prices, and an unwillingness to submit to a reduction, which indicate a conviction that the supply of native wheat is nearly exhausted. The season, too, is a very late one, and it will certainly be from ten to twelve weeks before we get a supply of new wheat of any extent. Before that time expires, the whole of last year's produce will have been brought to market, and it is even probable there will be a short period in which the supply will not be adequate to the demand. It is for the miller and merchant to consider how this *hiatus* between the finishing of the old and the commencement of the new crop is to be filled up. The quantity of foreign wheat now in the country cannot be large, the entire importation in the eight months up to the 5th May having amounted to only 1,129,520 quarters—not much more than a fortnight's consumption, and a large portion of it has already been disposed of. The supply since then has been more liberal, amounting probably to 300,000 qrs., but even this is very inadequate to the wants of the country; nor shall we be able with the utmost exertion to make up the year's importation to two million quarters, reckoning from September to September. The Baltic merchants have already shipped off the stocks accumulated during the time the ports were closed by the frost; and if their reports are to be believed, they will not have much more to spare until the new crop comes in, which this year will be late with them as well as with us.

I see, by the letter of your correspondent, "A Constant Reader" in your number of this week, that he still holds to his opinion of a famine; but I cannot see it in that light at all, however difficult it may be to obtain the necessary supply of wheat. This country, in fact, can never suffer to that extent, unless under a combination of circumstances that are scarcely within the range of possibility—certainly not of probability. The famine in Ireland, in 1847, arose, not from the absolute want of food in the country, but from the poverty which confined the consumption of the lower class to one description of food, and that the cheapest; and their total inability, when that failed, to obtain any other. Thus, whilst the poor people were dying by hundreds from want of their common food, the potato, wheat and other grain was being shipped in large quantities at the various outports. Even in Dublin this was the case, as I witnessed myself, although not to so great an extent. In that city there certainly was no absolute scarcity of food; and yet many died of starvation, and hundreds from insufficiency of food, and the fever thereby superinduced. The absenteeism of the great landowners, the want of a respectable middle class, and the consequent small value of labour at that period, will fully account for the wretched state of the poor in that country.

In England, on the contrary, labour must necessarily be paid for, in some measure, according to the price of bread; or if this, in any case proves insufficient, the legal provision comes in aid to prevent starvation. Nor do the poor depend, as in Ireland, upon one description of food. Accustomed to what would be termed, in any other country in Europe, a luxurious diet, there is room for them to lower it, in case of necessity, which could not be done in Ireland, the wages (from 4d. to 8d. per day) not admitting of it.

Perhaps the nearest approach to a famine in England, in modern times, occurred in 1800 and 1801, when the price of bread rose to 2s. the quartern loaf. This occasioned a great deal of distress it is true; but the operation of the poor-law, which was extended to the whole of the married labouring population, came in aid; and I much question whether ten cases of absolute starvation to death occurred in the whole country. The poor, it is true, fell back upon a lower kind of food, and so did the respectable housekeepers generally, from a sense of duty. I well remember eating bread made of barley, wheat, and peas meal mixed; and this was commonly used in the farm houses, as well as in those of the working class.

Your correspondent, however, has no occasion to fear even such an extremity as this. The wealth of England will always ensure her a supply of bread stuff, of one kind or other. And if we cannot procure wheat, Brother Jonathan can furnish us with Indian corn, which is a wholesome and excellent substitute for it, if the people of this country would but adopt it. Under any circumstances this is desirable, and especially so when apprehensions of a short supply of wheat are entertained. I am arguing now upon the principle of your correspondent, and to meet his fears for the future; but I am far from agreeing with him as to the result of the next harvest, or the disasters which he considers so imminent. On the contrary, I feel convinced that if no future calamity happens to the wheat, we shall have an average crop; and further, that even this should not prove to be the case, we shall still be able to obtain a supply of bread stuff—of an inferior description it is true, but wholesome and nutritious, and in sufficient quantity to avert the horrors of famine.

Yours truly, S. C.

June 16.

APPLE BREAD.—A very light pleasant bread is made in France by a mixture of apples and flour, in the proportion of one of the former to two of the latter. The usual quantity of yeast is employed as in making common bread, and is beaten with flour and warm pulp of the apples after they have been boiled, and the dough is then considered as set; it is then put into a proper vessel, and allowed to rise for eight or twelve hours, and then baked in long loaves. Very little water is requisite; none, generally, if the apples are very fresh.—*Enquire Within.*

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

SPECIAL COUNCIL, *May* 30: Mr. MILES, M.P., President, in the Chair.

DEPUTATION TO PARIS.—The following letter from the Consul-General of France having been laid before the Monthly Council on the 2nd of May, when preliminary arrangements were made in reference to the formation of a Deputation to the Agricultural Meeting to be held at Paris in the first week of June, was again submitted to the members at this meeting, specially summoned for making the final appointments :—

"Londres, le 28 Avril, 1855.

"Monsieur—J'ai l'honneur de vous informer que M. le Ministre de l'Agriculture, du Commerce et des Travaux Publics vient de me faire savoir qu'il verrait avec la plus vive satisfaction que la Société Royale d' Agriculture d' Angleterre envoyât en France des délégués pour la représenter au Concours Général Agricole qui doit avoir lieu à Paris. Son Excellence me charge d'assurer la Société Royale de toute la sympathie qu'une pareille démarche de sa part inspirerait au Gouvernement de l'Empereur.

"Je vous prie donc, Monsieur, de vouloir bien faire part au prochain Conseil de la communication que j'ai l'honneur de vous adresser. Je suis d'autant plus heureux d'être ici l'interprête du Gouvernement de S. M. I., que connaissant les dispositions favorables de la Royal Agricultural Society of England, je ne doute pas de l'accueil empressé que recevra de ses membres l'invitation de son Excellence M. Rouher.

"Veuillez agréer, Monsieur, les nouvelles assurances de ma considération la plus distinguée,

"Votre très obéissant serviteur,

"Le Consul Général de France,

"ED. HERBET."

"James Hudson, Esq.,
"Secretary to the Royal Agricultural Society of England,
&c., &c., &c."

The following Deputation was then appointed—Mr. Miles, M.P. (President), Mr. Garrett, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Hudson (Castleacre), Mr. Hudson (Secretary), Mr. Jonas, Mr. Milward, Professor Simonds, and Professor Way.

The Consul-General also communicated to the Council the request of the Minister of Agriculture and Commerce, that they would kindly undertake to name two jurors to act on the part of this country, at the Paris Agricultural Show, in the classes of Short-horned and other cattle, and in those of Pigs and Sheep. The Council decided accordingly, that Mr. Milward, of Thurgarton Priory, should be requested to act in the former, and Mr. Fisher Hobbs in the latter, of those classes.

WEEKLY COUNCIL, *May* 30.—Mr. MILES, M.P., President in the chair.

DAIRY MANAGEMENT.—Mr. Horsfall, of Burley Hall, favoured the Council with the following additional communications, which (with the former ones) were referred to the Journal Committee :—

"Burley Hall, May 23, 1855.

"As I observe from the papers that the subject of dairy produce is again to be discussed at your next council meeting, I beg to introduce the following observations confirmatory of my former statement. From December, 1854, when the peculiar richness of my cream was first noticed up to the date of this, my dairy proceedings have been closely watched by myself, and more particularly by one of my family, whose care and exactness may be relied on; the result throughout has been a yield of 25 oz. of butter from each quart of cream, with but slight variations. During the same time frequent experiments have been made on the proportion of butter from milk; these have shown a yield, also with little variation, of 2 quarts from 32 of milk, or 3 from 48, and in like proportion. When the churning took place of the butter, from which the sample was sent to Prof. Way for analysis, I personally superintended the process of 15 quarts churned at three times in equal quantities; the first five gave 127 oz. of butter. I measured the butter milk, and found it to be barely 3 pints; the proportion will be per cent.:—

Butter	70
Butter milk	30
	100

The remaining two churnings varied but little, as will be seen from my former statement. Up to the close of April the diet of my cows underwent little change, Mangold being substituted for Kohl Rabi. I then added the following ingredients to my steamed mixture:—1½lb. of Rapeseed per day for each cow, ground with an equal quantity of Barley; together, 3lbs.; after this, a like quantity of Linseed, treated in the same manner. These experiments were continued nearly three weeks. I did not find any increase in the quantity of cream, nor in its richness in butter. My cows have now been more than a week on depasture, during daytime; they are supplied with two full feeds of the steamed mixture evening and morning, whilst in stall: my most recent churning gave fully 24 ozs. from each quart of cream. The weight of the butter is ascertained after it has been made up, and in the state in which it is disposed of. My observations on dairy treatment tend to the conclusion that if you afford a cow an ample supply in her food of each element, both mineral and organic, suited to her requirements, constitution, and produce, she will use them to the greatest advantage, and with the most complete result; that if you go beyond this by an excessive supply of material suited for butter or for curd, the result will not show a greater proportion of these substances. Having now explained my *modus operandi*, and the results at which I have arrived, I beg leave to state to your honourable Council, that, if it should appear that I have omitted anything calculated to arrive at a sound and correct conclusion, I should be most willing to receive and attend to instructions which may be deemed serviceable; or if it should appear that inquiry on the spot would better serve the purpose, I beg to express my willingness to afford any one your honourable Council might depute the freest and fullest information I am possessed of. I am quite aware of the caution and mistrust with which remarkable or extraordinary statements are viewed by the agricultural mind. As some proof of this, I may instance

the recent remarks of an ably-conducted weekly publication, whose editor has certainly no interest in trying to impugn or weaken the statements of one whose communications he has frequently admitted in the pages of his journal:—

May 28, 1855.

The following detailed relation of my mode of testing the results of my produce, and of other regulations of my dairy, will, I am led to think, not be deemed uninteresting. The observations are on my most recent churning, early this morning, Monday, May 28th, and are on the milk skimmed during one-half of the week. I make butter twice a week.

	Skimmed Milk.	Cream.
1st meal	36 quarts.	$2\frac{1}{4}$ quarts.
2nd „	32 „	2 „
3rd „	36 „	$2\frac{1}{4}$ „
4th „	36 „	$2\frac{1}{4}$ „
5th „	36 „	$2\frac{1}{4}$ „
6th „	50 „	$3\frac{1}{2}$ „
7th „	48 „	3 „
Total skimmed ..	274	Cream $17\frac{1}{2}$
Cream for families..		$1\frac{1}{4}$
Total cream from 274 quarts..		$18\frac{3}{4}$

A considerable portion of my milk is sold when new. The sale of this varies in quantity, and leaves less or more each day for butter. My average yield per day is 145 quarts from 15 cows, from which I obtained in April 160 quarts per day. Before the cream was churned I tried to ascertain its quantity by observing to what height it reached in the cream-jar, and then filling this with water to the same height, when 18 quarts were required, the jar being more than 12 inches wide at the top, a slight deviation in ascertaining the height of the cream would account for the difference of the $\frac{1}{2}$ quart, $17\frac{1}{2}$ quarts being shown by the separate measurement. The consistency of the cream after having stood till churning is such that a piece of wood 2 feet 3 inches long, 1 inch by $\frac{1}{2}$ inch, on being dipped to half its length in the cream, retains, according as it is immersed, its upright or oblique posture; to measure it out by separate quarts is, therefore, troublesome. The churning commenced at an early hour this morning, before 4 o'clock. Temperature of dairy 49 deg., of cream 52 deg. The cream was churned in quantities of about 6 quarts at three times. The first churning-cream alone occupied 30 minutes; with the second and third 1 quart of fresh water was added to each. The time occupied was 45 minutes for each churning. The whole of the butter was of firm, good quality; that with the addition of fresh water having the preference. The result of these three was 17 rolls 6 ozs., 25 ozs. to the roll, of well-made butter. On deducting the 2 quarts of water there appeared full 5 quarts of butter-milk, without taking into account that portion washed out in making up the butter. These remarks confirm what I have previously stated; indeed, under like conditions of temperature, &c., there have been but slight variations during the six months in which these tests have been applied. Taking the cream as measured separately, $17\frac{1}{2}$ quarts yielding 17 rolls 6 ozs. of butter, show one roll of 25 ozs. per quart of cream, minus $6\frac{1}{2}$ ozs. on the whole. As computed on the aggregate, 18 quarts yield 17 rolls 6 ozs., show 24 ozs. of butter per quart of cream, minus 1 oz. on the whole. The comparison of butter to milk will be—

	Quarts.		Rolls	oz.
Skimmed milk	274			
Cream churned....	$17\frac{1}{2}$	Produce of butter .	17	6
Cream used	$1\frac{1}{4}$	From cream used ..	1	6
	$292\frac{3}{4}$		18	12

Gives from 16 quarts $25\frac{1}{4}$ oz. of butter on the morning of the 26th inst. The whole of my milk which had stood 36 hours became sour; the temperature on the previous day ranged at 60 deg. Early on the 26th I, in consequence, adapted my dairy to summer temperature, by supplying a shallow cistern of 3 inches deep, in which my milk bowls stand, with cold instead of warm water, which latter I use during cold weather. The water enters the cistern at one end, and, after travelling through the bowls, and filling the cistern to the depth of nearly 3 inches, escapes through a hollow perforated tube at the other end of the cistern; the taps are then adjusted so as to allow a constant trickling through the clay; besides this, a blind or curtain of strong calico or cotton fabric is hung before the trellis window, on to which cold water is spirted several times during the day, through a rose attached to a small gutta percha tube, so as to keep the curtain wet throughout the day. A thermometer with the bulb immersed in the water denoted a temperature of 51 deg.; one out of the water, even with the top rim of the milk bowls, 55 deg. 30 min.; one on a shelf of wood, 2 feet above the bowls, a temperature of 60 deg. A thermometer, placed on the outside wall to the north, and in the shade, denoted a temperature during a great part of the day of 72 deg. I need scarcely add that the result of the summer adaptation is most satisfactory; indeed, the experience of former seasons leaves me no room to expect any recurrence of sour milk during this summer season. Having satisfied myself that with a temperature much under 50 deg. I lose perceptibly in gain of cream and butter, and also with a temperature of 60 deg. I suffer from my milk turning sour, I cannot but remark on the lack of attention evinced in this country to the proper regulation of temperature in dairies, not only in small, but as far as I am aware, also in large ones. In the several treatises on dairy husbandry in the Journal of your Society, I do not recollect having observed any allusion to the policy of regulating the temperature of dairies. During the present season, certainly an uncommon one, I found it advisable to continue the warming process almost without interruption till the first week in May, when the thermometer ranged low—frequently during the night at some degrees below freezing point. Within less than a month I am necessitated to resort to means of subduing the temperature by the process I have described. "THOMAS HORSFALL."

A MONTHLY COUNCIL was held on the 6th of June. The following members of Council and Governors of the Society were present: Mr. Raymond Barker, V.P., in the chair, Earl of Yarborough, Lord Berners, Lord Portman, Sir Stafford Henry Northcote, Bart., M.P., Sir Matthew White Ridley, Bart., Sir Robert Price, Bart., M.P., Mr. Barnett, Mr. Hodgson Barrow, M.P., Mr. Barthropp, Mr. Gadesden, Mr. Hoskyns, Mr. Kinder, Mr. Lawes, Mr. Marshall, M.P., Mr. Slaney, Mr. Thompson, Capt. Viner, Mr. Wilson (Stowlangtoft), and Mr. Woodward.

Samuel Courtauld, Esq., of Gosfield Hall, near Halstead, Essex, was elected a Governor of the Society.

The following new members were elected:

Atkinson, Thomas King, Cardew Lodge, Carlisle
Aylmer, Robert Boughen, Westacre, Swaffham, Norfolk
Baker, William Henry, Cottesmore, Rutlandshire
Beattie, James, Newbie House, Annan, Dumfriesshire
Beckett, William, Helmingham, Ipswich
Beele, John Edward, Durham
Bence, Capt., Kentwell Hall, Long Melford, Suffolk

Birkbeck, Thomas, Settle, Yorkshire
Bownass, William, Bownass, Kendal, Westmoreland
Bradbury, Thomas, Rastrick, Huddersfield
Clemitson, Thomas, English-street, Carlisle
Cobb, William Henry, Colchester, Essex
Codrington, George, Eynsham, Oxfordshire
Colthard, George, Stone House, Haybon, Carlisle
Davies, H. D., Spring Grove House, Hounslow
Eddison, William, Huddersfield, Yorkshire
Ernest, Henry, 3, Budge Row, Cannon Street, London
Evans, Henry Jones, Llanelly, Carmarthen
Garne, John, Filkins, Lechlade, Glouc.
Gater, John, Westend, Southampton
Geldard, Christopher John, Cappleside, Settle, Yorks.
Huntsman, Benjamin, West-Retford, Nottinghamshire
Jeaffreson, Christopher Edward, Melton, Suffolk
Jobson, William, High House, Staveley, Kendal
Jobling, Edward (Lloyd's agent), Carlisle
Knight, Edward, High Lealow, Gloucester
Lyall, William, Western Port, Victoria, Australia
Miller, John, County Asylum, Aylesbury
Nevile, George, Stubton, Newark-on-Trent
Nicholson, John, Stone, Staffordshire
Norman, John, Botcherby, Carlisle
Ormond, Francis, Owston, Oakham, Rutlandshire
Ridgway, Alexander, jun., Leicester Square, London
Rothwell, W., Talbot, Foxholes, Lancaster
Rust, William, Good-Easter, Chelmsford, Essex
Scott, Joseph, Blackhall Wood, Carlisle
Simpson, John, Roman-Way, Plumpton, Penrith, Cumberland
Standing, Thomas, Preston, Lancashire
Stutfield, William, Hildersham, Cambridgeshire
Thom, James, Blackenborough, Penrith
Unthank, John, Netherscales, Penrith
Waugh, Thomas, Warwick Bridge, Carlisle
Westmore, Charles, Stone, Berkleley, Glouc.
Wilkinson, William, Witney, Oxfordshire.

FINANCES.—The Chairman reported the result of the Monthly examination of the accounts, from which it appeared that the current cash-balance in the hands of the bankers was £2,876.

JOURNAL.—Mr. Thompson, Chairman of the Journal Committee, reported the following adjudications:—

I. To the Rev. W. R. BOWDITCH, of St. Andrew's, Wakefield, Yorkshire: the prize of £30, for the best essay on the chemical changes which occur in the decomposition of dung.

II. To ROBERT VALLENTINE (land-surveyor), of Burcott Farm, Leighton Buzzard: the prize of £10, for the best essay on the retention of moisture in Turnip soils.

The Committee also reported the following recommendation, which was adopted by the Council:—

That in future, under the head of "MISCELLANEOUS COMMUNICATIONS," a portion of the journal be allotted to short papers from such members of the Society as may favour the Journal Committee with an account of any matter of special interest which has come under their notice, in the management of their farms, or in their immediate neighbourhood.

CHEMICAL INVESTIGATIONS.—Mr. Thompson also reported from the Chemical Committee the following recommendation, which was adopted by the Council:—

That in future, the one or more subjects of lectures to be given by the Society's consulting-chemist, in the following spring, be fixed before the Council adjourns over the summer vacation; and that the subjects for chemical lectures in 1856, be fixed at the Monthly Council in July.

CARLISLE MEETING.—Mr. Raymond Barker reported from the General Carlisle Committee the progress of the arrangements for the Society's Meeting to be held at Carlisle in the last week of July next.

A SPECIAL COUNCIL was held on Wednesday, the 13th of June. The following Members of Council and Governors of the Society were present: Mr. MILES, M.P., President, in the chair, Lord Bridport, Sir Matthew White Ridley, Bart., Sir John V. B. Johnstone, Bart., M.P., Sir Montague Cholmeley, Bart., Sir Robert Price, Bart., M.P., Mr. Raymond Barker, Mr. John Raymond Barker, Mr. Barthropp, Mr. Cavendish, Mr. Kinder, Mr. Sillifant, Mr. Simpson, Mr. Slaney, and Mr. Wilson (of Stowlangtoft).

CARLISLE MEETING.—Mr. Raymond Barker reported the further arrangements made by the General Carlisle Committee in reference to the ensuing Country Meeting at Carlisle.

JUDGES.—The Council appointed the Judges of live stock for the Carlisle Meeting, deferring the appointment of Judges of implements and machinery until the next monthly Council, when the Report of the Implement Committee would be received, and their recommendations taken into consideration.

PAPERS AND LECTURES.—The President, in referring to the resumption of the business of the weekly meetings of the Council, announced the following arrangements:

1. That on Wednesday, the 20th of June, at 12 o'clock, Mr. Thomas Scott's Paper on the Production of Butter and the Management of Dairies would be read, and a Statement be made by Mr. Slaney on a simple and economical Mode of removing Soil from one part of a Farm to another.
2. That on Wednesday, the 27th of June, at 12 o'clock, Professor Way would deliver before the Members a Lecture on the use of Fish as Manure.
3. That on Wednesday, the 11th of July, Professor Simonds would deliver before the Members a Lecture on the physiological Conditions affecting the Quantity and Quality of Milk secreted by the Cow under different Circumstances of Feeding and Management.

A WEEKLY COUNCIL was held on the 20th of June: present, Mr. MILES, M.P., President, in the chair, Lord Berners, Sir Matthew White Ridley, Bart., Sir Montague Cholmeley, Bart., Mr. Ambrose, Mr. Raymond Barker, Dr. Calvert, Colonel Challoner, Mr. Corbet, Mr. Deere, Mr. Goold, Mr. John Gray, General Hall, Mr. Knowles, Mr. G. P. Lloyd, Mr. Orlebar, Mr. Chandos Pole, Mr. Parkins, Mr. Scott, Mr. Slaney, Prof. Way, Mr. Western, Mr. Wilson (Stowlangtoft), and Major Wollaston.

BUTTER-MAKING AND DAIRY MANAGEMENT.—The following communication was read from Mr. Thomas Scott, of Charing Cross:

5, Charing Cross, May 30, 1855.

It may not be unacceptable to the Council that I should give, in writing, the substance of the verbal statement which I made before the Weekly Meeting of the Society on the 2nd inst., relative to the production of butter; and I shall now endeavour briefly to do so. My attention was especially directed to this subject two years ago by being appointed agent and receiver for the Audley estate, in the county of Cork, where the production of butter is the mainstay both of landlords and tenants. I had previously for many years been intimately connected with some of the leading dairy counties, and much interested in this matter as resident agent on the estate of Lord de Tabley, in Cheshire; afterwards on that of the Duke of Argyll, in Kintyre; and latterly on the estates of Joseph Neild, Esq., M.P., in North Wilts and Somersetshire —all of which estates were dependent mainly on dairy produce for their incomes. I shall, therefore, address myself to the practical results of my experience, just as Professors Way and Hodges, and I may add Mr. Horsfall, of Yorkshire, have done to the theoretical part of the subject, and the abstract principles connected with it. The question of the best mode of obtaining a large yield of butter from a certain number of cows having been raised by the reading of a communication from Mr. Horsfall to Professor Way before the Society, on the 11th ult., I thought it a good opportunity to submit to the Council some incidents that had come under my own observation in connexion with dairying, and a few particulars relative to the trade in butter, especially with reference to Ireland. When we know that about 17,C00 tons of butter are annually consumed in this metropolis alone, costing probably £100 a ton, or £1,700,000, the immense importance is apparent of ascertaining the best process of realising the largest extract from our dairies. At the same time, this process, though ascertained, must occasionally be modified by local circumstances, such as the demand for skim or buttermilk, and our ability to turn either of these important residues to advantage. In Ireland, for instance, the taste for skim milk is almost national, and it is extensively used in all private families, and in the numerous public establishments, such as barracks, workhouses, and gaols, that unfortunately exist there. In Cheshire, on the other hand, buttermilk is universally consumed by the farmers' families, and their servants, and others. In the south of England, again, this is a beverage almost entirely avoided. Now every practical dairyman will readily perceive that the ability to sell skim milk in one place, and buttermilk in another, or to feed calves profitably with the former, or pigs with the latter, must have an important share in forming a decision whether to churn from the whole milk, or from the cream alone, especially if the difference in the produce of butter between the two processes is as slight as I take it to be. Professor Trail makes out the following table from an experiment with four cows, in the month of June last year :

		grains.
1st.	Butter from scalded or Devonshire cream	1.591
2nd.	Do. from acid milk and cream	1.447
3rd.	Do. from slightly sour whole milk	1.247
4th.	Do. from sweet cream	1.137
5th.	Do. from sweet milk and cream	None.

The quality of all these samples was good, and nearly equal. Mr. Dillon Croker, a good Irish authority, doubts the correctness of the above results, and thinks the produce from the cream alone has not been fully extracted. Even if it had, he shows by calculation that it is more profitable in his district by 8s. in the 7*l.*, or 5*l.* 14s. 3d. per cent. on the produce, to churn from cream alone, and to sell the skim milk, than to churn the milk and cream, and sell the buttermilk. My inquiries lead me to believe that this holds good in the majority of cases; butter from cream alone is always richer in oil, and of better colour, than when made from whole milk, which produces more casein in the butter. We have equal discrepancies as to the best breed of cows for producing butter. Professor Trail made an experiment on this point, and found the Kerry cows to rank first, the Galloways second, and the Ayrshires third. Had the short-horns been included, I think they would have come in last. Of the Kerries' milk, 8½th quarts yielded 1 lb. of butter; of the Galloways' 9½ quarts; and of the Ayrshires', 10 2-5th quarts; and their average daily produce of milk was 7¼, 6¼, and 9 quarts. I am inclined to think, after many trials during the last 13 years, that the old Irish and the Channel Island cows, crossed with the short-horns, make the two best butter-producing animals, and are otherwise suitable for the dairy. The mixing qualities in different animals of the same breed are, however, so various, that I am inclined to trust more to good shapes as indexes of mixing qualities, than to breed. Judgment and taste in selection are, therefore, more to be relied on. In Cheshire I had two cows, a short-horn and a cross-bred, of the same age, and feeding together: the one gave 17 quarts of milk per day, which yielded only 18 ounces of butter; the other gave 10 quarts, which yielded 22 ounces, being more than double the ratio of the former. This is a suggestive subject for the physiologist. As a rule, *quantity* of milk should be obtained for cheese-making, and *quality* for butter. Quality in milk arises partly from the breed of the cow, partly from her physiological character, and partly from the food she obtains. When much thin milk is obtained, the quality of butter made from it is never so good in taste, colour, or solidity as when made from richer milk. This, I have found, arises from the excess of casein, and the greater difficulty of totally extracting it from the butter. What remains produces sourness, unless counteracted by extra salting. It also forms air cells, which originate rancidity and decay. I am now having a machine made to remedy the latter tendency. It is a hybrid between Clayton's piston clay-pugging machine and Ainslie's, with its rollers, being a screw piston in a circular cylinder. By the process I propose, the butter will be forced out in a continuous cake about an inch in thickness, and will pass over wooden rollers revolving in a frame containing the finest powdered salt, with a small mixture of fine sugar and nitre, when these are required to sweeten and preserve the butter. This cake of butter will be rolled up like a roll of calico after passing over these rollers, and will be again passed through the machine with a die on, that will form it into rolls, squares, or any other shape required. When this is done, I find, by experimental trials with clay and sand, that the salt will be completely amalgamated with the butter, and that it will be as hard and solid as a block of wood. I believe this process will make the most perfect mild, corned, or salted butter yet produced, and which will keep sweet for any length of time. I have no doubt it will be found of great value where a large quantity of butter is made. I am indebted to a suggestion of Professor Way for the original idea of this process of curing butter, and I shall willingly incur some expense to give it a fair trial. I propose designating it "Way's Butter-pugging and Salting Process." The Professor may thus be the means of supplying the two greatest desiderata to the perfect production of this important article, namely, scientific knowledge of its constituents and the food required to produce it, and mechanical contrivances for its proper manufacture. The most important point to be aimed at, and the one most easily attained, in our present state of knowledge, is the improvement of the quality of at least one-half of the

butter made in England, and nine-tenths of that made in Ireland. An average cow will yield 196lb. of butter a year; and an increase of 1d. per pound in price is a gain of 16s. 4d. a head per annum, equal to about 10 per cent. on the whole produce. This, however, is much less than the increase in price which could be secured by a little more knowledge on the subject, and by a little more pains in the several processes of management. I have attended to the returns of prices for the last ten years; and in all our dairy county markets—namely, Cheshire, Gloucestershire, North Wilts, and others—they range ten per cent. below the prices of Dutch and other foreign butter: and in the great butter-producing county of Cork, extending over an area of 1,846,333 acres, the average prices are 20 to 25 per cent. below those obtained for the imported Dutch and Friesland butter. In several English and Irish counties, not strictly dairy counties, butter of the very finest quality is produced; but the quantity is so small that it has little influence on the aggregate returns from our home markets, and the result is, that upwards of 50,000 cwt. of Irish butter is annually sent abroad at an inferior price, being quite unfit for home consumption, while at the same time we annually import, as we did last year, upwards of 400,000 cwt. of superior foreign butter, representing the produce of 220,000 cows, or all the cows in Scotland. Now, here are 22,500 tons of butter travelling backwards and forwards across the English Channel, while we might without cost improve the quality of what we export, and keep it at home, and by so extending our knowledge of the principles of butter-making increase our production, and obviate the necessity of any importation at all. Though our dairy districts are not without examples of an exact adherence to spotless cleanliness, it is not so universal with us as with the Dutch and other continental dairy people. Nor are we so well able as they generally are to interpret the reasons for our different operations. They clothe their cows, because they find they give more milk; and they know that they do so because the heat of the body is not uselessly dissipated in cold air, and that, if it were so, more food would be consumed to supply the carbon required to sustain the necessary animal heat of the body. They also know, by the light of science, why one kind of food produces an excess of cream, and consequently butter, and another casein, and consequently cheese; why poor food produces poor milk, and goes back to the soil in the shape of poor manure, thus enabling milch cows so fed to impoverish the soil on which they graze, while cows getting food rich in the ingredients which milk contains give rich milk and also rich manure, the latter being then equivalent to, or in excess of, the substances extracted from the soil in grazing. Look also at the care with which the continental governments protect the consumers against inferior butter. In Friesland, all butter-firkin coopers are under Government inspectors, and are bound, under a fine of 25 guilders, or 2*l.* 1s. 8d., to use specified wood; half these fines going to the informants, and half to the poor of the parish where such casks are made. All coopers must have their names on their casks, and the date of their make; and the inspector examines them, and charges ½d. on each, and the Government brander then puts his mark upon them, and charges another ½d. No butter can be sold except in these casks, and specimens of all classes of authorized wood, and even of iron hoops, are kept at the district magistrate's. We have a well-grounded objection to Government interference in this country, and the great agricultural interest is thought able to take care of itself. So, the returns from our cattle, corn, and dairy produce have become, to a great extent, dependent on the salesmen of Smithfield and elsewhere—on the corn-factors of Mark Lane, and on the cheesemongers of London; and most people who have depended on any of these powerful interests, know how unsatisfactory the results usually are. Yet the English Government takes little or no cognisance of how any of our great agricultural marts are regulated. Private enterprise occasionally steps in, as in the case of the establishment of the "Chippenham Monthly Cheese and Butter Market," by Joseph Neeld, Esq., at a cost of upwards of 15,000*l.* Here we have an open market with ample accommodation, good regulations, and nominal charges. Dairy farmers in the surrounding districts are therefore no longer dependent on isolated individual purchasers; for here a hundred cheese factors and dealers compete for their produce and I have seen 20,000*l.* worth of cheese change hands in a few hours. This shows how much a well regulated outlet for dairy produce is required and appreciated. I was several years on the managing committee, and was led to the conclusion, from data coming constantly under my observation, that it has considerably enhanced the value of all the dairy produce made, within an area of 20 miles. A bill has lately been brought into Parliament to regulate the numerous small local markets of Ireland, but its progress has been very tardy, and it may not be of much practical value when obtained. I will take one great trade combination in Ireland as an instance of how the agriculturists are handled, generally, in the sale of their produce; I allude to the "Cork Butter Market." At it there are annually sold about 340,000 firkins of butter, equal to 200,000 cwt., and worth upwards of 1,000,000*l.* Now, all this immense quantity of dairy produce is thought unworthy of any notice by the Government, and its sale is consequently left to a committee of Cork butter merchants, who naturally regulate the matter to suit their own interests. They appoint their own "inspectors" and "branders;" take off their own tare, namely, 3 lbs. per firkin of 70lbs.; pay themselves a commission for buying the farmers' butter; combine and fix their own weekly prices, and are, as a matter of course, all very rich, several being members of Parliament. This, I think, accounts for the Cork butter being the lowest priced in the three kingdoms, although the pastures are nearly all on limestone, and the herbage of the best butter-making quality. About one-third of the butter brought to Cork is put into iron-hooped firkins and sent abroad, being unfit for home consumption. All butter sold in the local and more independent markets in the adjoining counties of Carlow and Limerick brings 1d. per lb. more than if sold in Cork under the thraldom of the "Butter Weigh House Committee." Ten-pence per lb. is now about the price for first-class brands. I herewith send, for the inspection of the Council, six samples of butter made by my directions on the Audley estate, in the county of Cork. This butter is the produce of cows of the native Irish breed, fed on natural pastures and Italian rye-grass, and is made at the rate of 14 oz. per quart of cream, the cream being obtained at the rate of one quart from nine quarts of milk. The churn used is Anthony's patent. Mr. Horsfall, it will be shown further on, obtains only ⅔ of a quart of cream from 10 1-7th quarts of milk. By the subjoined account, copied from the books of the "Weigh House Committee" last month, you will perceive that the farmers who send their produce to its care were charged, for the year ending the 10th March last, the large sum of £5,128 16s. 8d., which is made up thus:—

Produce of butter scrapings	£1427	2	6
Fees for butter inspection from farmers ..	3291	5	5
Ditto for cask inspection from ditto.....	284	9	11
Fines	125	18	10
Total	£5128	16	8

It is almost needless to say that this powerful organisation is ruinous to the farmers who are under its control, and is much and loudly complained of; but so, I fear, it must remain until re-modelled or superseded by a higher hand. It is the interest of all dairy farmers to study more carefully than they do at present how to improve the quality of their butter. I am sorry to have to state my belief that few know anything at all of the principles that ought to regulate their several processes. I say this reluctantly but confidently, after having, for the last 10 years, as a resident agent, been in immediate contact with at least 500 rent-paying occupiers of this class. The first of the following tables shows the results from feeding, in an experiment by Mr. Cunningham, the manager of the Munster model farm, under the Board of National Education in Ireland; and the second the results in connexion with an experiment made under my directions on the Audley estate, in the county of Cork:—

EXPERIMENT AT MUNSTER MODEL FARM.

No. of Cows.	Duration of Experiment.	Date.	Food per Head Daily.	Produce. Milk.	Cream.	Butter.	Milk to produce a Quart of cream.	Cream to produce a Pound of Butter	Milk to produce a Pound of Butter.
	Days.			Quarts.	Quarts.	lbs.	Quarts.	Quarts.	Quarts.
7	3	April	70 lbs. Mangold and 50 lbs. Turnips	171	23	19	7.43	1.21	9.00
12	7	July	Italian Ryegrass *ad libitum*	602	115	75	6.01	1.53	9.22
12	7	Sept.	Clover, second cutting	524	88	60	5.95	1.46	8.73
12	7	Sept.	Cabbages	576	92	62	6.26	1.48	9.29
12	7	Oct.	Ditto and Mangold leaves	648	94	60	6.89	1.56	10.08
12	7	Oct.	Mangold leaves alone	848	127	86	6 67	1.47	9.86
12	7	Dec.	50 lbs. Mangold and 60 lbs. Turnips	672	93	74	7.22	1.25	9 08
			Averages	4131	632	496	6.63	1.44	9.06
			Gross product from 12 cows, £152 13s. 5d.; profit per cow, £5 17s.; per acre, £3 3s. 6d.; ground per cow, 1 acre 1 rood 16 perches.	561.57	61.71	62.28	6.63	1.44	9 18
			AUDLEY ESTATE EXPERIMENT.						
3	123	Augr.	31 Italian Ryegrass, clover, and bruised Oats	2580	446	442	8.02	1.01	8.54
3	61	Oct.	31 Ditto with Vetches and Cabbages	1780	202	196	8.59	1.04	8.82
3	30	Nov.	30 Mangold leaves, Turnips, and bruised Furze	817	82	74	9 96	1·11	11.04
*3	121	Dec.	31 bruised Furze, Turnips, and straw chaff	3602	407	384	8.91	1.06	9 38
3	39	April	30 Mangold, hay and straw chaff, and Oats	810	80½	70	10.06	1.15	11.54
	365		Averag	10599	1217½	1166	45.54	5.37	49.32
5)				2107⅘	243½	233.1/5	9.10	1.07	9.86

* Fresh cow put in.

[NOTE.—These are not calculated to show a comparative result, but only the product arising from good keep and careful management. It is considerably in excess of the ordinary tenants' produce in the same district]

The most important points to be attended to, then, are these—a good breed of cows; proper food and abundance of it. Let the temperature of dairies always be regulated by a thermometer, and kept at from 50° to 60°, with proper ventilation, that the cream may not become musty; and let them always be thatched, or, if slated, coated with lime-wash, as Mr. Mechi's buildings are, that the roofs may radiate and not absorb the sun's rays. Skim the cream off the milk in about 36 hours in summer, and 48 in winter, after milking, and churn in 48 hours afterwards; put the cream into the churn at a temperature of 50°, and after the butter is formed let the whole remain in the churn an hour to cool. When wrought up, either for sale fresh, or for putting in kegs and corning, let the hands of the person employed be continually dipped in cold spring-water, and let the whole of the liquid be extracted and the residue left as compact as a deal board. Use no colouring—the fine Dutch and Epping butters of the London market having no saffron, annatto, or carrot juice in them; avoid much and coarse salt—compression and solidity will keep out the air, and preserve corned butter; and the weight gained from adding salt at 1d. per lb. is doubly counteracted by the reduction in price. Neither apply hot-water in making up—it firms the butter, but impoverishes it of its best qualities, and spoils the flavour. A little more salt is, however, required in summer than in winter. Keep clear of turf smoke and potatoes, both of which readily communicate a bad flavour to butter, which is much complained of in the Cork market; use white wood, and not brown firkins; and when the butter is packed, weigh it down with a half cwt. for a few hours before heading up. If these points are attended to, any one in this coun ry will at once succeed in rivalling the best Dutch or Friesland butter. To increase the quantity of butter, cows must be soiled, and fed on more nutritive food than at present; they must never have to labour for their food. They must also be kept warm, and at an equal and well-regulated temperature. Here, again, an eighteenpenny thermometer must be hung up. I have also found an increase of milk to arise from giving cows wooden instead of stone or brick beds to lie upon. I tested this carefully on Mr. Neeld's estate, where they may still be seen in use. Never keep old cows—their milk is thin and poor; strip the cows thoroughly each time they are milked, as the last pint contains more butter than the first quart. A tenant of Lord de Tabley's, who kept 45 cows only, and died a few years ago worth £30,000, often told me that he had made half his fortune by daily seeing to this point for 30 years. Churn early in the morning, say at 4 o'clock, using a good churn and never contending with a bad one. If the cows are allowed to graze, change the pasture each time they are milked, as I have seen this produce the best results. If they are housed, let them go loose if possible. A good model building on this principle for 100 cows, designed by Mr. Godwin, the editor of the *Builder*, may be seen at Wall's Court farm, near Bristol, belonging to his Grace the Duke of Beaufort, and occupied by Mr. Thomas Proctor, who, along with his Grace's agent, Mr. Thompson, of Badminton, personally inspected many of the best homesteads in England, before adopting the plan. These, then, I believe to be the most essential requisites to ensure a profitable return from the dairy. Relative to Mr. Horsfall's particular practice, I fear its pecuniary value to dairy farmers will be found on investigation to bear no proportion to our original expectations. His return of 25 ounces of butter from one quart of cream appears at first sight something wonderful; but it proves nothing. The proportion which the butter produces bears to the whole milk is the only result of practical value that we have to look to. By analyzing his statements it will be seen that this is as 1 lb. of butter to 10 1-7ths quarts of whole

milk, and, as shown by the following 17 returns, this produce of Mr. Horsfall's does not exceed an average.

Trials.	Breed of Cows.	Milk required to produce 1lb. of butter.	Cream from 10 quarts of milk.	Butter from 10 quarts of milk.
		Quarts.	Quarts.	Ozs.
Trail's....	Kerry	8.12	1.33	19.70
	Galloway ..	9.50	1.16	16 84
	Ayrshire ..	10.40	1.08	15.38
Scott's ..	Shorthorn ..	15.11	0.88	10 52
	Crossbred ..	7.27	1.57	22.00
Sherrat's ..	Cheshire ..	14.22	1.12	11.00
	Ditto	13.33	1.24	12.00
Munster Model Farm	Irish cows 12, av. of 7 trials..	9.18	1.43	17.42
Audley Estate	Irish cows 3, av. of 5 trials ..	9.80	1.66	16.32
	÷9 ..	96.93	11.47	141.18
	Average ..	10.77	1.27	15.68
Horsfall's ..	Yorkshire..	10.14	0.64	15.78

The next question is, does his system of feeding and his other appliances produce more than an average quantity of milk. On the contrary, the milk from which Mr. Horsfall attained the above extract of butter is only yielded at the ordinary rate of 10 quarts per cow per day. There then only remains the extra richness of the manure to be considered. We know from experience, in connection with oil-cake fed cattle, that this is considerable, but whether it is sufficient to compensate him for his liberal feeding must to some extent remain a matter of opinion; at all events it appears to me to be the only consideration that can be held out to induce others to adopt his expensive system of treatment. The residue of buttermilk obtained by Mr. Horsfall also appears unusually small, being only 30 per cent. of the cream churned; whereas the usual residue is fully 50 per cent., and the following experiments by Mr. Dillon Croker, in the county of Cork, and Mr. John Williams, an experienced dairy manager on a large scale in the same county, show an average of 60¾ per cent.

	Cream churned.	Produce in Butter.	Buttermilk.
Mr. Croker's experiment..	128 qts.	112 lbs.	70 qts.
Mr. Williams's.....	160 „	136 „	104½ „
÷2	288	248	174½
	144	124	87¼

=60¾ per cent.

This would lead us to believe that Mr. Horsfall's butter is not so well worked and free from butter-milk as it should be, and consequently not of the first quality. We ought to have an average sample of his butter before us, together with the price obtained for it during the last two months, to enable us to judge of its quality and value. If his butter were extracted from ordinary creams, which I think the comparative table given above shows it is not, the result would overthow the reliability of all the Society's reported trials in connection with competing churns during the last and previous years. The best churns and richest creams were used on those occasions, but in no instance did the extract reach beyond 70 per cent. of Mr. Horsfall's. When the Board of Agriculture was in existence, Mr. Cramp, the keeper of the House of Correction at Lewes, reported to it the average annual produce of a cow he kept for eight years, at £41 8s. 3d., arising from his mode of treatment; and this return was confirmed on personal inquiry by the Earl of Chichester. The result was obtained by frequent and liberal feeding, which was minutely detailed and laid before the public; but this "high farming" in the dairy has not been found suitable for general adoption. Other isolated instances of excessive produce could be enumerated. For instance, I was aware of two cows in Cheshire possessing great milking qualities, and obtaining highly nutritious food, which gave for several consecutive months—the one, 40 quarts of milk per day, yielding 4½ quarts of cream, and 2 6-7ths lbs. of butter, the other, 36 quarts of milk, yielding 4½ quarts of cream, and 2 5-7ths lbs. of butter. These cases, however, are entirely exceptional. The average produce from a first-rate cow, well kept throughout a season of say nine months, seldom exceeds 2,700 quarts of milk, yielding 300 quarts of cream, or 1 quart of cream for 9 quarts whole milk, and 262½ lbs. of butter; which is at the rate of 14 ounces of butter from 9 quarts of milk, or 1 quart of cream; and which is little more than one-half the weight of butter obtained by Mr. Horsfall from an equal quantity of cream. To show that the breed of cows, as well as their food, has a good deal to do with the yield and constituents of milk, I may mention that on an estate in the south of Scotland under my management some years ago, there were two farms in hand, which were stocked with a breed of Ayrshire cows, devoted to cheese making. Not thinking it profitable to make cheese, a herd of 45 Alderney Cows was substituted for them on one farm, and butter made from the whole milk under the direction of an experienced Ayrshire dairy maid; and after three years' experience it was found that these animals produced more butter off the same land than their predecessors; but when an attempt was made to convert their milk into cheese the weight of produce was lamentably short of that obtained, from the Ayrshires. Again, in the county of Cork, especially on the fine limestone land around the city of Cork, the butter extracted from a certain quantity of milk far exceeds that obtained from an equal quantity on the alluvial pastures in Cheshire; but when cheese is attempted in the former locality, as it has often been, and is now being done at Castle Townsend by Mr. Chambers, a Scotch farmer, it falls far short of the quantity obtained from a cow in Cheshire. The quality is also inferior to the English cheese. It thus appears that both the breed of cattle and the food they obtain have a special influence on the quantity and quality of produce, sufficient, I think, to induce us to study more closely than we now do the adaptation both to the general or special purposes of our farm and dairy management. No truer remark could be made than that contained in the report of the Farming of Cheshire, in 1808, by Dr. Holland. He says: "Many attempts have been made to imitate Cheshire cheese in other counties, but never successfully. Some brought their kine from Cheshire, others their dairy-women, but it doth appear they should have brought the land also." About seven years ago, the late Mr. Leigh, of Belmont, in Cheshire, tried to bring this knowledge more under our control, and carried out a system of weighing a large number of cows weekly, on the principle Mr. Horsfall has now adopted; but in consequence of his death, the undertaking, I think, was abandoned, and I am not fully aware to what result it led, as far as it went. This is to be regretted, as it is only through such detailed researches that we can hope to acquire an exact knowledge of the means necessary to guide us to fixed and accurate results. We know, for instance, that bone-dust applied to pasture land in Cheshire means an increase of cheese, and that coral sand in Cork is, in reality, butter; but when we learn from Professor Way the fact that the food most rich in the materials composing the animal products and plants, to the production of which it is specially applied, does not produce in them a corresponding increase of their essential ingredients,

we see that chemistry does not yet furnish us with fixed and uniform rules for our guidance; thus linseed and other highly nitrogenous substances, when given to milch cows, produce a greater amount of casein than they do of oleaginous material or butter, which is the reverse of what chemistry would lead us to expect. Again, the phosphates when applied to the soil, increase the produce of turnips far beyond that of wheat, although the latter is found to contain much the largest percentage of phosphates. It is these exceptions to the conclusions arrived at by the inductive reasoning of the analytic chemists that require them to refer occasionally for information to practical experience, and which has rendered them unable, up to the present time, to remedy clover sickness by applying to the soil the ingredients necessary to build up that plant. Another anomaly is, that of some poor pastures producing very rich milk. When this is the case, we are now well aware that they must rapidly become poorer, as most of the nutritive properties of the food are absorbed and carried off in the milk, and the excrement becomes proportionally devoid of all restorative power. The reverse of this produce is, however, more common; for instance, on the great Ballynahinch estate, Connemara, probably the poorest in herbage in the three kingdoms, an experiment was lately made for me, when 70 quarts of cream yielded only 31½ lbs. of butter, equal to 7½ ozs. per quart of cream. Having been favoured by the Irish Executive with the whole of the Reports to the Commissioners of National Education in Ireland, on the 33 model and 96 workhouse and other agricultural schools in that country, I cannot fail to observe that they exemplify an amount of careful and quiet investigation, especially into dairy processes, which must lead to useful results, and which ought to have a parallel in England, unless we are willing to allow the Irish people to outstrip us in scientific agricultural education. The Irish occupier's great desideratum I have already stated, verbally, to be the want of suitable dairy accommodation; and few cows being held by one owner is another serious drawback, as it necessitates the cream being kept too long before the quantity necessary for a churning is made up. ¶I would earnestly urge upon Irish landowners, whose estates are occupied by a numerous small tenantry, the advisableness of adopting means to remedy drawbacks so seriously affecting their tenants' returns from the land they occupy, as well as their own. I can assure them, from personal experience of estates in Ireland, with which I am professionally connected, that there would be no unwillingness on the part of the tenants to avail themselves of, and to pay for, any real advantages or improvements placed within their reach. In England the appliances on dairy farms are generally liberal; but few of them are constructed on sound scientific principles, and few of the occupiers are at all imbued with a due appreciation of what men of science and research are doing for them. THOS. SCOTT.

Professor Way's lecture on Fish as Manure, intended to be delivered on the 27th of June, is postponed to the 18th of July, in consequence of Professor Way being subpœnaed to give evidence in a court of law next week.

BUTTER-MAKING AND DAIRY MANAGEMENT.

It has ever been our custom to test any very attractive theory or wonderful achievement in the pursuits of agriculture, by the experience of the practical man. And what, after all, is a practical man? Simply, as we take it, one who contrives to live by his business. Surely, then, it comes pertinently enough that he should ask if he can live by adopting this discovery, or implicitly following out that panaçea? Enthusiasts are proverbially a little wild, and as famed for clothing their own fancies in the brightest colours. When, then, we hear of all they are accomplishing, it is an equal duty to them and to ourselves to see, in the first place, *what* really has been done, and, again, *how* it has been done. There is no word in the English language just now so much abused or libelled as this same progress. It is the *Presto!* of every would-be conjurer. "Hey! Progress!" he exclaims, indignantly, "don't stand there doing only just what you have done, but progress as I do." And the practical man, no ways flurried by all this fine talk, coolly and closely watches the tricks and transformations of his platform friend, communing much in this wise with himself as he does so—"Are you, indeed, progressing quite as much as you make out; or what, after all, have you done more than other people? Let us see!"

Let us see. It is now some weeks since that the Royal Agricultural Society of England received, through the hands of Professor Way, a communication from a Yorkshire gentleman, who is not, we believe, exactly a farmer, a grazier, or dairyman. In a word, he has some other business to live by. The subject of his letter, however, proved to be highly interesting to the followers of any of the pursuits just mentioned: he promised, in fact, to effect a complete revolution in the production of one of the most important articles of every-day consumption. If that man, as we are told, is a national benefactor who makes two blades of grass to grow where only one grew before, what shall we say of Mr. Horsfall, who makes two pounds of butter where, so far, we have only managed to make one?

This was the point and moral of the story. There might be expensive feeding, high farming, if you please; but look on a little to the result—Mr. Horsfall made twenty-five ounces of butter from a quart of cream! Nobody, certainly, had ever heard of anything like it before. The records of the Journal of the Society, with all their careful reports, essays, and experiments, were searched in vain to approach, even, so extraordinary a fact. The members held their breath, or, when they

recovered it, duly gave "their thanks to Mr. Horsfall for this communication." There the matter might have dropped; or have only gone on with everybody learning to feed and manage their cows precisely as Mr. Horsfall does, and to double their produce accordingly. No one understood it, but so it was. Professor Way, to be sure, gave a lecture shortly after this, on the production of butter generally; but he left Mr. Horsfall very much alone, or if he led us to gather anything from what he said, it was rather in favour of the feat recorded. We had evidently arrived at a new era. Even science did not exactly know how, but still the paper would of course be duly embodied in the Journal, and twenty-five ounces of butter from a quart of cream thrown straight in the face of any unenlightened gentleman who was found to be going on much as he had gone.

If science, however, was inclined to give it up, practice has luckily solved the enigma. Another paper on butter was read at the weekly Council Meeting of the Society on Wednesday last; and, without a doubt, one of the most valuable and instructive papers that has ever been written on the subject. It emanates from Mr. Thomas Scott, a gentleman who has had some considerable experience of the practice of agriculture in England, Scotland, and Ireland. It will be seen to how good a purpose he has used this. Well disseminated as his contribution will now be, it can scarcely fail of the most beneficial effects. For Ireland more especially there are parts of his paper which might be distributed in hand-bills; and it must be strange indeed if his remarks do not tend something to correct the monstrous abuses of the Cork butter market. We hope some of "the butter merchants in Parliament" will look to it. The general application of the whole letter is yet perhaps more valuable: the breeds of cattle that answer best in the dairy—the way they should be kept—the time at which the butter should be churned—the manner in which it should be made up—the machinery that might be employed here. We can only request our readers to go carefully through an article that we are happy to give at length, and that comes so well under the proceedings of the Royal Agricultural Society of England.

But it is as a test of Mr. Horsfall's achievements, of that gentleman's much-vaunted "progress," that this paper has a peculiar value. Well might Mr. Barker, in proposing a vote of thanks to Mr. Scott for it, characterize him as "having come to the rescue." How awkwardly would that first letter have read in the Journal without this rider to it! How much harm might the first alone have done, if allowed to appear uncorrected! How much good may follow but with this commentary on it! Mr. Horsfall's wonders are wonders no longer, for Mr. Horsfall has not done more than other people. Mr. Horsfall in no way exceeds a common average: he takes quite as much milk to make these twenty-five ounces of butter as other people do—his cows give no more milk than other people's cows. The only secret is in a kind of cream of cream, his quart of cream taking as much milk as would generally make two. "The practical value," however, of all this, as Mr. Scott remarks, is in the quantity of milk produced and the amount of butter made from it. Here Mr. Horsfall sinks at once to an average; while his system of high feeding comes, again, to what it long has been—simply a question of manure.

"Progress" if you please. We are no opponents to progress: far from it, we hope. But we are opponents of humbug. We cannot shut our eyes and open our mouths, and swallow all that is told us. On the part of the farmers of this country—on behalf of men who have to live by their business—we must have these things tested. Whether they come upon us in twenty-five ounces of butter, or twenty-five tons of hay, still must we repeat, *has* it been done, and *how* was it done? We congratulate the Royal Agricultural Society of England on its last week's very useful application of this principle.

COOKERY—EFFECTS OF HEAT UPON MEAT.—A well-cooked piece of meat should be full of its own juice or natural gravy. In roasting, therefore, it should be exposed to a quick fire, that the external surface may be made to contract at once, and the albumen to coagulate, before the juice has had time to escape from within. And so in boiling. When a piece of beef or mutton is plunged into boiling water, the outer part contracts, the albumen which is near the surface coagulates, and the internal juice is prevented either from escaping into the water by which it is surrounded, or from being diluted or weakened by the admission of water among it. When cut up, therefore, the meat yields much gravy, and is rich in flavour. Hence a beefsteak or a mutton-chop is done quickly, and over a quick fire, that the natural juices may be retained. On the other hand, if the meat be exposed to a slow fire its pores remain open, the juice continues to flow from within, as it has dried from the surface, and the flesh pines, and becomes dry, hard, and unsavoury. Or if it be put into cold or tepid water which is afterwards gradually brought to a boil, much of the albumen is extracted before it coagulates, the natural juices for the most part flow out, and the meat is served in a nearly tasteless state. Hence to prepare good boiled meat, it should be put at once into water already brought to a boil. But to made beef-tea, mutton-broth, and other meat soups, the flesh should be put into cold water, and this afterwards very slowly warmed, and finally boiled. The advantage derived from simmering—a term not unfrequent in cookery books, depends very much upon the effects of slow boiling as above explained.—*Professor Johnston's Chemistry of Common Life.*

CREAM.—It is curious that the milk of mares and asses, though considered to be highly nutritive, affords scarcely any cream.

SPECIFICATIONS OF AGRICULTURAL PATENTS

PUBLISHED DURING THE PAST MONTH.

[Can be had of Bennet Woodcroft, Esq., Great Seal Patent Office, 25, Southampton Buildings, Chancery Lane, London, by remitting postage stamps to cover value and postage for sums under 1s., and Post-Office Orders above it. Single copies will generally require six stamps, but one pound weight can be had for them.]

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REVIEW.

PATENT OFFICE PUBLICATIONS.

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AN APPENDIX TO THE REFERENCE INDEX OF PATENTS OF INVENTIONS, containing abstracts from such of the early patents and signet bills as describe the nature of the invention, and which patents have no enrolled specifications. By Bennet Woodcroft, Esq. Price 4s.

Her Majesty's Commissioners of Patents for Inventions, are labouring zealously, and successfully to carry out the provisions of the Patent Law Amendment Act, 1852, for the

public interest; and we have again to thank them for another valuable volume of old inventions, a large number of which are connected with agriculture. They extend as far back as the year 1617; and illustrate, in a very interesting manner, the progress of science. We give the following as an example:—

"No. 544.—A.D. 1734.

"MEINZIES.

"Apparatus for Threshing Grain—a row of flails fixed in an axis turned backwards and forwards.

"George the Second, by the grace of God, &c. To all whom these presents shall come, greeting: Whereas our trusty and well-beloved Michael Meinzies, Esquire, hath by his petition humbly represented unto us, That, having studied mathematicks, and applied himself sometime to mechanics, he fell upon an invention for threshing grain, which, with a long tract of labour, thought, and experiments, joined to a good deal of expense, he has brought to a great simplicity and perfection. That the said machine is moved by any regular power, and threshes with common swipples, by which the grain will be threshed at far less expense, and two per cent. (if not more) of the grain will be threshed out of the straw more than the common way, from both which a very considerable advantage will arise to all farmers, and at length to our landed subjects. That he is the sole inventor of the said machine or invention for threshing corn or other grains, as mentioned in his said petition, which threshes the grain with a row of flails fixed in an axis turned backwards and forwards, and so threshes the grain on both sides."—*From Letters Patent, Rolls Chapel.*

CALENDAR OF AGRICULTURE.

The sowing of turnips is to be finished in the early part of this month; the crop is wholly sown in July in the eastern counties, as the fly is not so destructive as on the June sowings. Horse and hand-hoe potatoes and swedes, and the earlier common turnips; the former may be earthed up and finished, and any tall weeds that rise afterwards must be pulled by hand. Morton's expanding horse-hoe, on the principle of the parallel ruler, takes a good hold of stiff soils, and cuts the sides of the drills with the knives always straight from the principle of expansion. The gaps in the drills of swedes are often advantageously filled up with plants cut out in thinning, and also with cabbages. Moist weather is required. Keep the scufflers and hoes in constant employment: allow not any weeds to grow. Much advantage is derived by the plants from stirring the land in dry weather, causing evaporation of the moisture, and the absorption of it by the leaves of plants, the pulverization of the soil, and the minute division of particles, one prime cause of fertility.

The clay fallows demand a most earnest attention after turnip sowing is finished; plough, harrow, and roll repeatedly; pick off every weed and stone, and get ready the applications of dung and lime. Get done any draining that may be required; if the whole, or a part of a field, it must be begun earlier, that the land may be duly wrought for the dung and seed. If the land be wet, keep the water furrows open during summer.

Draining should be done on the grass surface of any wet lands; the neatness and cleanness with which the work can be done during dry weather on unbroken ground, will fully compensate for any hardness in the digging. Winter, however, is the time for marking the course of draining when only partially required, being then indicated by rains and dissolutions of snow.

Fold the store flocks of sheep very assiduously, both on arable and pasture lands; carry clovers and vetches twice a-day from the field to the yards for soiling horses, cattle, and swine; the milch cows may be very conveniently lodged in yards at night, and have artificial food. In all cases provide ample littering, as the manure will repay all pains and cost.

The latest lambs will now be weaned, and must have the best encouragement.

The hay harvest will be most generally finished this month; make and carry it with the utmost despatch consistent with safety; have water-proof tarpaulings to lay over the rick in heavy rains, and in moderate showers suspend over the rick a light sail-cloth my means of a pulley at the ends. For getting up hay, use a scaffold raised on four upright posts, resting below on a four-wheeled platform, and elevate or depress the scaffolding by means of pulleys; lay some loose straw on the top of the rick for a few days: so soon as it is compressed, pull the loose hay, dress the rick, and thatch it immediately, the straw being always in readiness for the purpose. In cases of damage to the hay from rain, mix with salt as before directed.

In early localities, the reaping of grain crops will commence this month. The early peas, rye, and barley will be first ready. Have waggons and carts in sufficient repair, barns cleaned out, and rick-stands in readiness; prepare thatch.

Look that the pasture fields afford water to the cattle, and attend that no fences be broken. Do not overstock the land—rather the grass be master.

Attend to the sheep flocks; guard against flesh-flies and maggots; apply the specific remedies given.

Put mares to the stallion regularly.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JUNE.

From the extreme backwardness of the crops generally, up to quite the end of May, much anxiety has been manifested, during the whole of the present month, to ascertain their progress, together with the prospect of the next harvest. All unfavourable reports, all feverish anxiety on the subject must, we feel assured, give way to congratulations, when we call attention to the following observations—founded on practical experience, sound judgment, and extensive inquiry—on the all important subject of the soil's produce. In the month's early part, owing to the continuance of cold winds, wheats, even in the most favoured localities, made very little progress; but some fine rains having visited most parts of the United Kingdom, and the temperature having become seasonably mild, a great improvement was speedily observed in them, their growth became more rapid, and by the 21st they were in ear, both in Essex and Kent, as well as in some other counties. Although we have received accounts stating that the crop cannot prove a large one, we are of opinion, judging from present appearances of the fields, that it will be nearly or quite equal to 1854. This, by the way, may be considered a bold opinion to hazard, seeing that the growth in that year was, perhaps, the largest on record; but there is one feature in the present crop which requires particular notice, and which may result in a heavy yield. We here allude to the *fact* that upon nearly the whole of the light and inferior soils the wheats present a most luxurious appearance—*a more promising one*, indeed, than last season; whilst those upon the heavy soils were, in our judgment, never looking stronger. The great produce in 1854, it will be remembered, was the result of over abundance—if we may use the term—of the light lands, which now promise an unusually large return. Should our estimate prove a correct one, we shall secure for ourselves an amount of independence, so much required at a time when the harvests of the world have not offered us the usual supplies, and when we are engaged in a prolonged war with the only country in Europe able to meet our additional wants. The barleys have wonderfully recovered of late, and, with some few exceptions, they promise a good return. As regards oats, beans, and peas, we may observe that, from the high and remunerative prices at which wheat has been selling for some time past, the breadth of land under their culture is comparatively small; hence, we do not look to any important return from them, though the acreable produce may be good. Opinions differ, of course, respecting the amount of land cultivated with wheat, this season; but although we have no official data to guide us, we contend that it is considerably in excess of *all* former years. It follows, therefore, that with a heavy yield per acre, our prospects, as regards a supply of food, are unquestionably good.

We have now to advert to another matter calculated to exercise great influence upon future prices—a much greater than usual, from the small supplies of grain which are likely to reach us during the remainder of the year from abroad, viz., the quantity of wheat at this time in the hands of the home growers. This important subject is difficult of solution, more especially when we consider the very large quantities which have passed into consumption week by week ever since the close of last September. The supply disposed of has nearly doubled the sales in the corresponding period; and yet there are no complaints of scarcity in any quarter. We may observe, however, that a strong feeling has lately sprung up amongst the more wealthy holders to part with stocks, which, in ordinary seasons as regards price, would have been held over until after harvest. This desire to sell, arising, no doubt, from the present remunerative prices, the favourable reports of the crops, and the possibility of larger imports, from a peaceable solution of our dispute with Russia, may so reduce the stock of English wheat by the end of August, that a great scarcity of old qualities to mix with new samples, may be experienced during the winter; hence, there is a prospect of good wheats of the growth of 1854 commanding a high range of value for some considerable time. Of course, much will depend upon the condition in which the new wheats are secured; but our decided impression still is, that anything approaching a low range of value cannot be calculated upon. But the question of actual stocks on hand is still undetermined; and upon this point we have caused the most extensive inquiries to be made. Taking those inquiries respectively, and the replies made by our correspondents, we have come to the conclusion that a *large* quantity is still in stack, certainly considerably in excess of 1854; and we may reiterate the state-

ment that we made some months since, to the effect that, with the aid of moderate imports from abroad, we shall be able to meet the consumption, without adding much, if anything, to present prices, although it is very evident that we shall begin to consume the new crop with a very small quantity of old wheat in growers' hands.

That the growth of potatoes in nearly every district in England last year was enormous, is admitted even by those who were, at one time, the greatest sceptics. We have before drawn attention to the reports of an unfavourable character, which appeared in some journals, and we have felt it our duty to oppose them, knowing that they were not based on truth. Even now, the metropolitan and other markets are well supplied with old potatoes in a saleable condition, and the prices lately paid for them have much disappointed those who have held over for many months, under the impression that this esculent would become very dear. The supply now remaining must, from its rapid deterioration, be disposed of at a low value. From all that we can learn, it would appear that a great breadth of land has been planted with potatoes this year, and that there are strong reasons to hope, from the fine appearance of the haulm, for an abundant growth.

The hay harvest is likely to be very late. Up to the present time, cutting has been only partially commenced; but the quantity of grass has wonderfully increased of late. The stock farmers have thus been relieved of great difficulties under which they laboured in the previous month, and their expenses, in providing for the wants of both beasts and sheep, are materally lessened; nevertheless, the various markets have been well—though not to say heavily—supplied. The beasts have come to hand in excellent condition; but the sheep have been mostly forwarded in very little more than a half-fat state. Prices have rapidly fluctuated, and have kept up remarkably well; whilst store animals have been held at unusually high rates. Prime meadow and clover hays, from their scarcity, have somewhat improved in value; but straw, from its great abundance, has been rather drooping.

At length, we have to report a steady revival in the demand for English wool. The trade is now more healthy than for many months past, and prices are steadily improving, notwithstanding that the supplies on offer are very extensive. The next series of colonial wool sales will commence on the 5th of July, when nearly 70,000 bales will be offered. They are fully expected to go off well, as the stocks in the hands of manufacturers are small, and as money is very plentiful and cheap.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the fluctuations in the prices of nearly all kinds of fat stock, especially in those of beasts and sheep, have been very extensive, the quotations still keep high, and in accordance with the views we long since expressed respecting future value. For the time of year, the supplies have been but moderate as to number; yet we have observed a slight improvement in the general weight and condition of the sheep, whilst scarcely any beasts have been exhibited beneath average quality. Lambs have not shown any great weight of flesh; but there has been very little to complain of in this respect, considering the severe nature of the weather during the greater portion of the present year, and the small quantity of grass in the pastures.

The great event of the month has been the inauguration and opening of the Great Metropolitan Cattle Market, in Copenhagen Fields. The removal of the trade of Smithfield is hailed, both by consumers and breeders, as a great boon; and the amount of accommodation now afforded to the stock, and the other numerous advantages given to the graziers, are duly appreciated by the great mass of the community. As a commercial speculation, we think the new market will never be profitable until the City authorities have the power of moving the dead trade to the new market. If the whole slaughtering business of the metropolis should ever be carried on in Copenhagen Fields, the returns would no doubt fully justify the outlay of £400,000—about the cost of the new market. But, at present, slaughtering is carried on as usual, and no efforts have been made to secure a trade which alone can yield the authorities a fair return for the outlay of capital.

The stock in our leading grazing districts continues very healthy; indeed, scarcely any losses from disease have been reported for some time. The present abundance of keep is calculated not only to check disease, but to increase the weight of meat and lessen outgoings for dry fodder. The latter has been a most serious item in the graziers' expenses for several months, and has greatly interfered with profits.

Compared with the same month in 1854, the imports of foreign stock into London have been very moderate. As the season progresses, we are of opinion that they will show a further falling off.

The following supplies have come to hand:—

	Head.
Beasts	2,061
Sheep	7,542
Lambs	336
Calves	1,529
Pigs	65

IMPORTS AT CORRESPONDING PERIODS.

	1851. June.	1852. June.	1853. June.	1854. June.
Beasts	1,413	2,035	2,293	2,657
Sheep	7,937	9,784	10,529	9,873
Lambs	593	965	1,233	575
Calves	1,331	2,145	2,621	2,113
Pigs	651	227	191	995

The total supplies shown in Smithfield and in the New Market have consisted of—

	Head.
Beasts	19,173
Cows	380
Sheep and lambs	125,570
Calves	2,209
Pigs	3,180

SUPPLIES AT CORRESPONDING PERIODS.

	1851. June.	1852. June.	1853. June.	1854. June.
Beasts	17,805	18,209	20,137	18,921
Sheep and lambs	169,420	134,160	130,500	131,660
Calves	2,275	2,781	3,328	2,999
Pigs	2,611	2,820	2,565	2,670

During the month 8,600 Scots and shorthorns have come to hand from Norfolk, Suffolk, Essex, and Cambridgeshire; 1,800 of various breeds from other parts of England; 2,050 Scots from Scotland, and 295 beasts direct by sea from Ireland.

The highest and lowest prices have been as follow:—Beef from 3s. 4d. to 5s.; mutton, 3s. 6d. to 5s. 6d.; lamb, 5s. 4d. to 6s. 8d.; veal, 4s. to 5s. 6d.; and pork, 3s. 4d. to 4s. 4d. per 8lbs. to sink the offals. These quotations show a general advance of about 20 per cent. upon those obtained in June, 1854.

Newgate and Leadenhall markets have been fairly supplied. The trade has ruled steady, and prices have kept up well, though they have been subject to some extensive fluctuations.

SOUTH HANTS.

The prospects of the growing crop of corn have greatly improved during the past fortnight. Wheat, which at an earlier period was unusually backward, has since made very great progress, looking generally healthy and vigorous, more particularly on the wheat-growing lands; on the lighter description of soil there is an evident deficiency of plant. It is considered the extent of land under cultivation is fully equal to that of last year. Barley and oats have derived great benefit from the genial rains which have lately fallen. The usual breadth has been sown, and from present appearances, both bid fair for an average produce. Beans and peas are but little cultivated in this district. The winter beans, in many places, suffered very much from the severity of the weather; but spring sorts and peas are looking healthy, and at present are free from blight. The growth of grass is unusually light, and unless a speedy improvement take place, the make of hay will be the lightest for many years, and the old stocks nearly exhausted. As regards the stock of wheat held by the growers, it is very difficult to form an opinion; they have, up to this present time, supplied the markets most liberally. Spring corn is nearly exhausted; barley, from its relatively low price, having been very extensively consumed for feeding purposes. Oats also commanded a high range of price, and were brought very freely to market.—June 21.

EAST CORNWALL.

This district, in common with every part of England, has greatly suffered from the very severe winter and cold backward spring. The wheat plant, although much improved, is thin on the land. It is true, for a person to look over the hedge in passing, the appearance is favourable, the colour being good; and from the rapid growth lately made, one is led to believe that all is right; but on examination, very great deficiencies are generally found. Although the acreage is rather over an average, the general impression is that the crop of wheat in 1855 will be far below an average. Much, very much will, however, depend on the weather we now get. On the average of years, the wheat by this time is in blossom; but now not one ear is to be seen: so, under the most favourable circumstances, the harvest must be late, which is always precarious. The barley and oats are promising. The hay crop is likely to be much better than was expected. The very heavy rain we had on the 18th did immense injury, the Tamer and other rivers overflowing their banks. Fat cattle of all descriptions are exceedingly scarce, and high in price.—June 20.

ALTON, June 22.—The effects of the delightful changes in the weather have been truly astonishing. Rain, succeeded by sun—alternate genial showers and warm sunshine—have quite altered the appearance of the crops throughout the whole district. In our valley, and on the hills around us, we have a more than usual breadth of wheat sown. Not long ago, fears (perhaps then justifiable) were entertained that we should not get an average yield; now we think it not at all precipitous to anticipate a good per-centage above the average. Although the harvest will most likely be later than usual, yet a good one is in full promise at present. Spring crops of every description may be said to be in equal order. We have had rain and fair, showers and sun, and now we have a delightful set fair; the very weather one could wish for—the only kind which just now can "suit the farmer best." Perhaps nowhere have the effects of the change been much more visible than in the grass fields. It is true some sorts were got past great improvement; but no small quantity has been wonderfully altered. The meadows especially have derived benefit; they are really well bottomed, and are getting comparatively heavy: almost without exception it is so. We now want a continuance of the weather we are enjoying, with a good getting-in time, and we think we shall be blessed with a very good second-rate hay harvest. The hops throughout the neighbourhood are in a superior condition. It has been affirmed that neither fly nor lice of a destructive character have yet touched them; at any rate, they are remarkably clear. In several places the potato plant has suffered from the frost; but in general the crop looks well.

NORTH-EAST OF SCOTLAND.

To show how liable the prospects of the agriculturist, with reference to the crops, are to variation from one extreme almost to another, within a very brief space of time, at this season of the year, we may state that, if we had written this report on any of the last days of May, it could not, in consistency with truth, have been otherwise than as gloomy as possible; for almost everything at that date wore an aspect unfavourable in the highest degree to the hopes of the husbandman. We cannot altogether say that it can now be made exactly the reverse, but it may be very nearly so. The main drawback now (so far as our present knowledge and present circumstances enable us to speak with any certainty) is this—that vegetation has been so long kept in check by extreme cold and drought during the whole of spring, but more especially during last month, that crops of all kinds are, at this date, from two to three weeks later than they should be in what may be reckoned an average season. It almost necessarily follows, from this, that the crop must either be late—by which both the quantity and the quality of the produce are more or less endangered—or, if forced on to be sufficiently early, it must be light. It is possible that the

lost time may be redeemed; but this can happen only by the summer months being both dry and warm to a greater degree than ordinary; and if they are so, the oat-crop, which is impatient of drought, and which is our staple grain-crop here, must necessarily be reduced in bulk and weight. But, on the other hand, if we should have abundance of moisture, with a favourable temperature, the crop will continue growing to a period of the year at least somewhat later than usual, and to that extent the harvest must be late; whereas, if the future portion of the season should prove both wet and cold, there is considerable, and of course greatly increased risk, in our uncertain climate, that the temperature may not continue such, at an advanced period of the year, as to bring the grain to a favourable state of maturity. Such are the doubtful prospects before us at present in so far as the grain crop is concerned: but in this part of the country the farmer looks to his grass and turnips for a large proportion of the return for his annual toil. It was late in the season before the pastures were ready for receiving cattle, and up to the end of May grass was scarce, and the atmosphere very unfavourable to animals remaining a-field. The rapid growth which the first ten days of the present month brought has been again interrupted by a severe blast of northerly wind, of two days' continuance; and this has been succeeded by what has checked vegetation still more effectively—namely, a frost, for two successive nights, of a severity almost unprecedented at this period of the year. With regard to the turnip-crop, all that we can say at present is in the highest degree favourable; inasmuch as the weather having throughout the season been remarkably favourable for cleaning and preparing the land, everything has been done in that way that could be desired. The earlier-sown turnips have come up well; and no finer weather could have been wished for enabling them to obtain a good hold of the soil than that to which we have referred in the commencement of this month. A considerable breadth of potatoes has, we believe, been planted: all we can say of them at present is that they have appeared above-ground within the last two weeks, and that in many localities, if not indeed very generally, they have sustained more or less injury from the frost of the last two nights. The quantity of purchased manure, bones, and guano used by the agriculturists of this district for a number of years, has been very great. Fully more, we believe, than the usual quantity both of Peruvian guano for grain-crops and of bones and guano for turnips, has been obtained and put into the soil this season. Notwithstanding the deficiency of moisture during the months of April and May, the guano put on with the corn crop appears to be "telling" sufficiently well, and to give promise of a plentiful return for the outlay, that is, if grain continues at or near its present price.—June 20.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANNOCKBURN HORSE AND CATTLE FAIR.—The number of horses was less than usual. Good draught horses from £30 to £50; one draught horse at £60. Prices being high, the sale was slow; though a good many changed hands. The show of harness horses was not above the half of former years, probably from the great demands made for cavalry and artillery horses. The number of milch cows was about an average, and high prices for good quality. Lean stock were in some number, but a very indifferent show, and few sold. Very few fat; but what was good, selling readily at 10s. per Dutch stone.

BRECHIN FAIR.—The number of sheep was about an average. Hill wedders sold briskly, but the other sorts were rather stiff to sell. Southdown hoggs 34s., cross hoggs 22s. to 27s., ewes and lambs 15s. to 22s., black-fackd wedders 19s. 6d. to 27s. Fat sheep from 6½d. to 7½d. per lb. in the wool. A good number of the ewes and lambs remained unsold, but all the black-faced went off briskly. The cattle market on Thursday was largely supplied with beeves, a large proportion of which were of fine quality; and buyers being numerous, few good fat left the Muir unsold. Prime fat brought from 9s. to 9s. 6d., down to 8s. for inferior. Two-year-old stots and queys (crosses) brought from £20 to £21 10s. Year-old stots and queys, bred in the district, brought from £6 to £9; farrow cows and small queys at 6s. to 7s. per stone of their estimated weight when fat. Drove beasts from the northern counties brought from £10 to £17, according to weight and quality; but the lean beasts were a stiff sale. Cows near calving or in milk, of good figure and young, brought as much money as the best fat, and were in great demand. A large number of the drove cattle remained unsold, the sellers standing out for high rates. The show altogether was much beyond expectation; and the prices of everything good paying fine for feeding or wintering.

BUCKFASTLEIGH FAIR.—There was a good show of cows and calves, which sold at 48s. to 55s. per cwt. Sheep in moderate supply. Fat sheep in the wool 7½d., shorn ditto 6½d. per lb.; Dartmoor wethers 28s. to 33s. each; rams £4 10s. to £6. Several lots of wool were purchased at 8¾d. per lb.

GIFFORD GREAT MARKET.—The stock, in all, numbered fully more than it did this time last year. The stock, in consequence of the severity of the winter, was not in such good coudition as last year. The buyers were numerous from all parts of the neighbouring counties; and the grass having come well away in consequence of the recent well-timed rains, the demand was good, and sales speedily effected. So early as eleven o'clock, a number of lots of all kinds were disposed of; and a lot or two were driven off unsold, as the holders would not submit to the prices offered. The sale kept steady throughout, and at the close of the market only two or three lots were turned out unsold. There would be a reduction of about 2s. a-head below the prices obtained last year; but the holders admit, taking the inferior condition of the stock this year into account, that they are as well sold this year as last. The show of all descriptions of cattle was larger than last year, and the stock, with the exception of a few lots, was in fair condition. The demand was rather dull, but a few lots of one and two-year-old shorthorns and stirks were disposed of at about the same rates as at recent markets. Mr. Lethhead, Galashiels, was the principal holder of this description of stock, and sold a lot of two-year-olds at £11; a large lot of stirks at £7 5s.; and another lot of the same age at £9. The same dealer refused £13 for a lot of two-year-olds. The Irish cattle were rather a meagre show, and the few sales that were effected were hardly up to the prices obtained at recent markets. At the close of this market a number of lots were turned out unsold. The show of milch cows was considerably above an average of former years, and the quality, in many instances, rather superior. There were not many of this description of stock that exchanged hands, arising from the exorbitant prices, altough there were a good number of dealers and private buyers looking after them. A couple of good milk cows brought £16 a-head; a few from £12 to £14; and down to about £10. The horse market was thickly studded with every description, more particularly draught horses. There were a few horses suited for light cavalry purposes, also a few light draught horses suitable for artillery work, which were readily picked up. The buyers were few; and the demand for the heavier kinds was on the whole bad, partly in consequence of farm labour being now finished for this part of the season, and few dealers being present who purchase these heavy beasts.

TEWKESBURY FAIR produced a small supply of stock, scarcely a dozen good cows being brought; but there was an abundance of store sheep and lambs. Buyers also were numerous. Beef fetched from 7d. to 7½d., and in some instances a shade higher. Mutton about the same quotation. Of pigs and horses but few were shown, and little business done.

CROSSKILL'S CARTS FOR THE ARMY IN THE CRIMEA.—We understand that a thousand carts and waggons have been ordered by the Government from Mr. Crosskill's works at Beverley for the use of the army in the Crimea and for the Turkish Contingent Army which is to be commanded by British officers. By employing more hands and working his machinery both night and day, Mr. Crosskill has been able to undertake this large order and supply the vehicles at the rate of 20 per day without delaying his ordinary work; a great number of the carts are already shipped, and on their way to the Crimea, and the whole will be delivered before the end of June. The rapid execution of such an order as this proves the great capability of the machinery employed at the Beverley Iron Works, for supplying the farmers of England with carts and waggons, and there is probably no other establishment in the country from which so large a quantity of vehicles could be turned out in such a limited time.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF JUNE.

There have been fewer fluctuations in grain during the month of June than the preceding month, the liberal imports of foreign from the north of Europe causing all buyers to make their purchases with the greatest care and caution, and as the weather was more or less favourable, they took smaller or larger quantities, scarcely ever purchasing beyond a fortnight's consumption, even when the market showed symptoms of improvement, and prices tended upwards. The weather for full one-half of June has been cold, and the temperature low for the time of year, the wind prevailing a good deal from the north-east, and this enabled the vessels to make quick passages from the Baltic, keeping the London market full of wheat and oats. There are no more prospects of Russian supplies coming forward than when we issued our last review, and the recent check to the arms of the allies appears likely to procrastinate the war to a distant period, and cause a continuance of provisions of every description to be purchased for the Crimea, whilst for the Baltic fleet, the contracts have been given to the Hambro' merchants—we think unfairly; as those of England have to bear the expense of the war, they ought to enjoy its advantages in a commercial point of view, and to have had the opportunity of tendering for these contracts, and supplying them exclusively; but it has been otherwise, and the prices of grain have been kept up at Hambro', as well as provisions, in consequence, and are still likely to remain high up to another harvest; the more so if additional quantities are yet wanted for the same purpose.

At Mark Lane on the first Monday in the month there was only a short supply of wheat from Essex and Kent, when all fine red qualities met a good steady demand at 1s. to 2s. per qr. over the rates of the previous Monday; the best samples, weighing 63lbs. per bushel, commanded 80s. per qr.; but there was no improvement in the value of white, and this description was taken off slowly, some quantity being left over unsold for future markets; the top price of rough-chaff and Chidham was 86s. per qr. There was only a moderate demand for foreign wheat, at about 1s. per qr. enhancement on the value of the better sorts; much of the supply was in poor condition, and parcels from the Baltic have generally sprouted grain in them, which is no recommendation, and much against the sale. The imports were very liberal, coming principally from the north of Europe, and consisting of 540 qrs. from Anclam, 284 qrs. from Bremen, 9,444 qrs. from Dantzic, 580 qrs. from Emden, 600 qrs. from Groningen, 1,786 qrs. from Hambro', 730 qrs. from Harlingen, 200 qrs. from Holbeck, 580 qrs. from Howacht, 510 qrs. from Husum, 620 from Kioge, 6,659 qrs. from Konigsberg, 370 qrs. from Norkoping, 470 qrs. from Nystadt, 680 qrs. from Praestoe, 5,324 qrs. from Rostock, 1,000 qrs. from Rugenwalde, 580 qrs. from Sonderberg, 2,686 qrs, from Stralsund, 64 qrs. from Tonning, 580 qrs from Wismar, 510 qrs. from Worcum, making a total of 34,697 qrs., against 30,274 qrs. the corresponding week of last year. This is the first week this season of the imports exceeding those of last year for a similar period. The London average registered 79s. 3d. on 5,748 qrs. The general returns were 76s. 10d. on 110,379 qrs., against 78s. 9d. on 65,791 qrs. the corresponding week of last year; the deliveries being so well kept up, the quantity returned was the largest of any week since the 30th December last.

There was a fair quantity of wheat brought forward from Essex and Kent at Mark Lane the second Monday, and the very favourable state of the weather for all crops had its accustomed influence on the minds of the buyers, and the millers took off the supply slowly, at a reduction of fully 2s. per qr. on all descriptions. A very moderate business was transacted in foreign wheat, at generally 2s. per qr. under previous rates, although the imports were not so liberal as those of the previous week; they consisted of 620 qrs. from Anclam, 281 qrs. from Bilboa, 1,160 qrs. from Bremen, 460 qrs. from Callundborg, 588 qrs. from Colberg, 4,234 qrs. from Danzic, 236 qrs. from Ghent, 1,160 qrs. from Greifswalde, 1,600 from Hambro', 382 qrs. from Harlingen, 2,066 qrs. from Konigsberg, 900 qrs. from Mullerup, 580 qrs. from Norkoping, 1,360 qrs. from Oporto, 443 qrs. from Ottendorff, 845 qrs. from Rostock, 690 qrs. from Santander, 722 qrs, from Stettin, 972 qrs. from Stockholm, 1,175 qrs. from Stolpemunde, 970 qrs. from Tarsus, and 2,140 qrs. from Wismar, making a total of 23,584 qrs., against 27,813 qrs. the corresponding week of last year, showing a falling off, and a difference in the week of 4,229 qrs., owing to a contrary wind for a few days for vessels arriving from the Baltic, and these being kept at sea a short time longer. The London average registered 79s. 7d. on

3,978 qrs. The general returns were 77s. 7d. on 102,923 qrs., against 66,083 qrs. at 79s. 11d. the corresponding week of last year; although this week's deliveries were 1,456 qrs. less than those of the previous week, they were kept up, and still very important, yielding a large sum of money to be spent in our own country, and not sent abroad for the benefit of foreigners.

The fresh supply of wheat from Essex and Kent at Mark-lane on the third Monday of the month was short; but some quantity having been left over from the arrivals of the previous week, there was rather more offering for sale than expected. Generally higher prices were demanded at the opening of the market, owing to an improved tone in the trade at the close of the week, and probably from the altered character of the weather—heavy showers having fallen at intervals since the previous Wednesday, and the temperature being at the same time considerably lower. All these circumstances taken into account, there was a general expectation of an improved market; but most parties were in this respect disappointed, and trade was only the same as the previous week, with this difference, that full prices were paid, and some choice lots of white were reported to have been sold at rather more money. In foreign wheat the transactions were unimportant, but without any quotable change in the value of any description.

The imports have again fallen off, and consisted of 215 qrs. from Bilboa, 435 qrs. from Brake, 11 qrs. from Carolinenseil, 500 qrs. from Cuxhaven, 1,300 qrs. from Dantzic, 500 qrs. from Donerodder, 420 qrs. from Groningen, 1,000 qrs. from Hambro', 3,506 qrs. from Konigsberg, 730 qrs. from Norkoping, 2,753 qrs. from Rostock, 1,400 qrs. from Saffi, and 1,970 qrs. from Stralsund; making a total of 14,740 qrs., against 17,244 qrs. the corresponding week of last year. There are, however, a good many vessels still on passage from the Baltic, which will come in with the first favourable wind, and after these arrivals a great falling off will take place from actual want of stocks in the northern ports of Europe. The London average registered 81s. 8d. on 4,068 qrs. The general returns were 89,297 qrs., at 77s. 5d.; against 51,182 qrs., at 78s. 9d., the corresponding week of last year. The deliveries were consequently 19,626 qrs. less than those of the previous week; but still very large, so far from last harvest.

There was a short supply of wheat from Essex and Kent the fourth Monday of the month, and very little offering by distant sellers who visit Mark-lane weekly; the supplies at home being generally required for the local demand of each county. A fair steady sale was experienced at the prices of the previous week. The best Kentish was disposed of first. The Essex factors held with rather more firmness; but the town millers were not disposed to buy more freely: the more so as the weather was very favourable for all the growing crops, the temperature being higher than of late, and from several districts there were accounts of fields being out in ear, progressing on the whole favourably, although slowly. There was only a moderate amount of business transacted in foreign wheat. The demand was mainly confined to the better qualities from the Baltic. A good deal of the supply coming forward in poor condition, this portion of it must go to granary for improvement. The imports were very liberal; consisting of 520 qrs. from Aalborg, 600 qrs. from Alsen, 350 qrs. from Apenrage, 300 qrs. from Bandholm, 578 qrs. from Bilboa, 495 qrs. from Brake, 875 qrs. from Bremen, 225 qrs. from Cadiz, 380 qrs. from Cappelar, 797 qrs. from Colberg, 386 qrs. from Corsoer, 4,334 qrs. from Dantzic, 330 qrs. from Eckenford, 3,397 qrs. from Hamburg, 480 qrs. from Kiel, 769 qrs. from Konigsberg, 2,000 qrs. from Leghorn, 544 qrs, from Lubeck, 773 qrs. from Neustadt, 1,280 qrs. from Oporto, 7,738 qrs. from Rostock, 2,485 qrs. from Stettin, 890 qrs. from Stralsund, 120 qrs. from Stockholm, 508 qrs. from Wadstenn, 1,900 qrs. from Wismar, and 600 qrs. from Ystad; making a total of 33,654 qrs., against 22,870 qrs. the corresponding week of last year. The London average registered 80s., on 2,490 qrs. The general returns were 77s. 5d. on 87,314 qrs.; against 78s. 3d., on 47,780 qrs., the corresponding week of last year. The deliveries from the farmers from this point will probably be less every week, until the harvest has been secured.

The fluctuations in the article of flour have been fewer and of less importance than those of the previous month, and have been principally in country marks, and of course most in Norfolks, to keep up their character and name of "Norwich Consols," by which they are now well known in Mark-lane and in most towns of their own county. The nominal top-price of town-made remained at 70s. per sack throughout the month. Households were, the first Monday, 62s. to 63s., country households 61s. to 62s., and Norfolks 54s. per sack. The arrivals for that day's market were 1,466 sacks coastwise, 14,351 sacks by the Eastern Counties and Great Northern railways, 50 sacks from Scotland, and 2,814 sacks and 767 brls. from foreign ports. At the second Monday's market trade relaxed, caused by a hot day or two in the previous week: the thermometer having been up to 78° in the shade at noon on Wednesday (the 13th), rather induced the holders to sell more freely, and Norfolks were "let go" at 52s. This influenced the town sellers of households, and they took 60s.

to 61s.; all showing more disposition to get off some of their stock, although that of the town millers was supposed to be very low, and the bakers have not, as usual, bought any quantity beforehand. The arrivals for that day's market were 2,488 sacks coastwise, 15,413 sacks by the Eastern Counties and Great Northern railways, and 8,527 sacks from foreign ports. On the third Monday prices braced up a little. Country marks generally were dearer, and Norfolks were up 1s. per sack, having commanded 53s. The arrivals for that day were 1,171 sacks coastwise, 13,064 sacks by the Eastern Counties and Great Northern railways, 11 from Scotland, and 4,171 sacks from foreign ports. On the fourth Monday there was a steady demand for all sorts at full prices, particularly the choicest country marks, and Norfolks ranged from 53s. to 54s. per sack. The arrivals coastwise were 3,524 sacks, by the Eastern Counties 10,836 sacks, by the Great Northern 2,182 sacks, and from foreign ports 1,550 sacks; making a total of 16,092 sacks by water and by rail.

The deliveries of barley have steadily fallen off every succeeding week: at present they indicate that the stocks in the hands of the farmers are very light. This article has been more in favour throughout the month than previously, and the distillers have purchased as much of fine fresh-thrashed qualities as they could meet with, and these sorts have improved the most, being wanted to lay by to be ready for the 1st of October, when they will be allowed to make malt in bond free of duty; but under most stringent clauses, and such as may cause much dissatisfaction to all parties referred to in the Spirit Act. It is the general opinion that this measure will be much against the interests of the maltsters, but for the benefit of the distillers; and from their being large buyers of the article, ultimately it will enhance the value of barley, and thus be very beneficial to the agriculturists, and next season prices will range much higher than they did last: the more so, if the heavy war-tax be reduced, and the old duty come into force again before the malting season commences. The imports of foreign throughout the month have been limited — coming principally from the north of Europe. The first week they amounted to 3,305 qrs., the second to 4,561 qrs.; the third week there were no imports whatever of the article; the fourth week the quantity reported was 6,827 qrs. All the better sorts have been placed to the distillers, who increase their stocks steadily, and take off much of the supply, leaving only the lighter qualities for grinding purposes. The future imports are likely to meet a good sale, and prices will, no doubt, be well kept up until new comes forward, and then prices may be fixed in accordance with the quantity secured. The four averages since our last month's review consisted of 17,224 qrs., at 32s. 11d.; 14,938 qrs., at 33s. 2d.; 11,599 qrs., at 33s. 11d.; and 8,438 qrs., at 34s.: the quantity having steadily fallen off every week, and the price being slightly enhanced weekly.

There have continued to be brought forward very limited supplies of oats from our own coast, somewhat more from Scotland, and a larger quantity from Ireland; whilst the imports of foreign have been on a very liberal scale. The first week of the month there were 410 qrs. coastwise, 121 qrs. from Scotland, 336 qrs. by the Eastern Counties railway, 67 qrs. by the Great Northern railway, but 38,659 qrs. from foreign ports. This large supply checked the demand from the buyers; but the factors remained firm, and good corn realized previous rates — secondary sorts being only the turn lower. The backward state of the grass, and prospect of a short crop of hay, gave the importers confidence, and induced them to hold their stock very firmly. From our own coast, the second week, there were only 51 qrs.; from Scotland, 296 qrs.; by the Eastern Counties railway, 77 qrs.; by the Great Northern railway, 205 qrs.; and from Ireland, 4,815 qrs. The imports of foreign, although not so large, amounted to 26,855 qrs. English and Scotch samples have become very scarce, and sell at high rates. Irish were in better supply, and these realized full prices. The demand for foreign was tolerably good, and the better sorts brought former rates readily; cargoes out-of-condition were taken reluctantly, as freshness at this season of the year is more essential than at any other; but as the vessels have made quick passages, there were not so many of this description offering as usual with so large imports, and they will be taken off the market by the large dealers before the ships come on demurrage to save the expense of landing, and ultimately go into consumption steadily when improved in condition or mixed off with fresher corn, and thus clear the way for future supplies yet likely to be kept up from the north of Europe. In the third week the arrivals coastwise were 365 qrs.; from Scotland, 44 qrs.; from Ireland, 1,750 qrs.; by the Eastern Counties railway, 783 qrs.; and by the Great Northern railway, 211 qrs. The demand from the country having extended, and generally increased, prices of all good corn were 6d. per qr. higher, and other sorts were quite as dear. The dealers and large consumers took off a liberal quantity, and the supplies are going into consumption extensively, and this is likely to be the case until the new crop has been secured and diffused throughout the agricultural counties, and supply the home wants. The arrivals the fourth week of the month consisted of 27 qrs. coastwise, 296 qrs.

by the Eastern Counties railway, 51 qrs. by the Great Northern railway, 1,539 qrs. from Scotland, 4,224 qrs. from Ireland, and a very liberal import —up to 37,332 qrs.—foreign. All good corn realized as much money, the market being only weaker for secondary sorts, and those cargoes which were out of condition; and of the latter there were rather more offering than previously. English and Scotch are nearly all cleared off the market; but Irish are more abundant, and amongst the cargoes from Sweden very fine corn is to be found —this description taking the preference of all others from the north of Europe, and command tolerably high prices: those weighing fully 40 lbs. per bushel realize 28s. per qr.; and some have actually weighed 43 lbs. per bushel, being as sweet after the voyage as new-made hay. From the north of Holland the quality has not proved so good, being mostly weathered and discoloured; these, however, sell steadily, the Polands principally to our corn-chandlers for their shop customers; and Danish have, on the whole, gone off well, some weighing 42 lbs., and where these have arrived in fair condition, they have met a good sale. It will be seen that the foreign imports of the month have amounted to 119,750 qrs.—amply making up for the deficiency from our own coast, and realizing to foreigners a large amount at present prices for this article.

There has been a tolerably steady demand for beans; and so long as the weather continued cold, the consumption of this article was well kept up, the very high prices of hay tending to throw the demand on to the best qualities, and the averages have steadily advanced until the close of the month. The stocks of English are much reduced, and are very low with all merchants on the coast at present; and they are not considered to be large in the hands of the farmers. From the north of Europe we have received small supplies all along the east coast, and there does not appear much prospect of any increase until the next crop has been secured; whilst from Egypt the imports have increased, and at this port, Liverpool, and Glasgow the stock has accumulated during the month, and of this description prices have been rather reduced. At present good Egyptians are worth about 36s. to 37s. per qr., delivered over the ship's side; and sales are made less freely than at any period during this year, and prices apparently tend downwards, with no spirit on the part of any buyers taking off large quantities; and as more are still expected, floating cargoes are difficult to place, and offered more freely than for a long time past; and, if the weather be fine for securing the crop of hay, this circumstance may aid in sending prices still lower than generally expected. The weekly averages have been 45s. 2d. on 5,370 qrs., 46s. 4d, on 4,580 qrs., 46s. 1d. on 3,909 qrs., and 46s. 6d. on 3,723 qrs. There were 4,570 qrs. of Egyptians in during the week ending the 23rd of the month.

The deliveries of peas in all the agricultural districts have been of the most trivial character, falling off steadily every week. And this article seems well nigh exhausted throughout the United Kingdom; whilst the imports of foreign have been very limited, and stocks are nearly as much reduced on the continent as in England. In all the Baltic ports the article has been wanted for the interior of Germany, and higher prices have been made there than here. From Canada we have received very few, as prices there, too, were above those with us. It is, however, an article we can dispense with more readily than any other; indeed the limited consumption of it throughout the severe cold weather in the winter months puzzled the trade, and prices were not enhanced, ranging, from the middle of February to the end of May, lower than they have been during the month of June. And now the supplies are so insignificant as to be scarcely worthy of notice by any description of buyer—too high for an investment, even if quantity could be found; and we believe there has not been a smaller stock held at this season of the year for a long time past; so that when the new crop has been secured, if the quality be fine, prices will no doubt open very high, ranging afterwards, of course, in accordance with the yield of this year's growth. The averages of the month were, 40s. 3d. on 488 qrs., 42s. 3d. on 369 qrs., 42s. 1d. on 262 qrs., and 43s. 6d. on 251 qrs. The deliveries will do doubt still fall off further during the next two months.

The imports of foreign grain for the month ending the 31st May, as published in the *London Gazette* of the 15th of June, were—860,705 qrs. of grain and 160,685 cwts. of flour and meal, against 1,052,155 qrs. of grain and 378,205 cwts. of flour and meal the corresponding month of last year. The different articles stand thus:—

	1854. Qrs.	1855. Qrs.
Wheat	611,993	497,838
Barley	78,010	60,408
Oats	158,355	147,113
Rye	5	70
Peas	7,601	12,982
Beans	37,476	53,900
Maize	158,696	87,087
Buckwheat	13	24
Bere	—	1,283
Total	1,052,155	860,705
Flour	378,205 cwt.	160,685 cwt.

The difference is not so great as the previous month; still, with all the imports from the Baltic, they have not amounted to those of last year, and after another month are more likely to become reduced again to about the same proportion as previously existed, as from America we have received little of any article, and prices must recede there materially after harvest to induce merchants to make consignments to this country.

The shipments of wheat in nearly all the Baltic ports have been pretty extensively made to this country; and our latest advices state that there is not much left, but that the stocks are well nigh exhausted; and beyond the vessels now at sea, little more can be expected. Prices have ruled very high, as might have been expected, from so many orders having been sent out from nearly all important ports of the United Kingdom. At Danzig fine 62lbs. wheat fetched 82s. per qr. free on board, and all other good sorts were proportionately high; but inferior 58 to 59lbs. was sold as low as 60s. per qr., free on board. Good wheats were held very high at Rostock, with little left for future shipment. There has latterly been a good business transacted in wheat at Hamburg, and an advance of 1s. to 2s. per qr. has been established. About 6,000 qrs. have just changed hands—58½ to 59lbs. Mecklenburgh at 71s. 6d., 60 to 60½lbs. at 73s. to 73s. 6d., 60 to 60½lbs. red marks at 72s. 6d. to 73s., 59½lbs. Wahren at 72s. 6d.: all these prices were for 480lbs. (a right poor weight) per imperial bushel, whilst in England 63lbs. is so common a weight. Holstein wheat from the east coast brought 71s. per qr. free on board, and Danish 59½ to 60lbs. reached 69s. per qr. Barley from Denmark, 53 to 54lbs., brought from the islands 31s. to 32s. per qr.; 55 to 56lbs. commanded 33s. to 33s. 6d. per qr. Extensive sales of Danish Oats have been effected; 41½ to 42lbs. from the east coast of Jutland realized 24s. 6d. to 25s. per qr. free on board, 38lbs. Swedish 23s. per qr.; 40½lbs. to 41lbs. kiln-dried Danish were held at 27s. to 27s. 6d. per imp. qr. free on board.

In the Belgian markets prices of wheat are very high. At Louvain, 62 to 64lbs. fine red has latterly commanded 82s. to 84s. per qr.; secondary descriptions, weighing 60 to 62lbs., realized 80s. to 82s. per qr.; rye, 56lbs., as high as 54s. to 56s. per qr.; winter barley, 50lbs., 40s. to 42s. per qr.; and oats, 8s. to 9s. per cwt.

The French markets have advanced freely for both wheat and flour. In the departments, for the week ended the 23rd inst., in fifty towns wheat was dearer, varying from 1 to 3 francs per hectolitre, with only a decline of 45 cents. at one town. The sales of flour at Paris have been extensive; the highest price obtained has been 96 francs for "Beauce" per 157 kilos., equal to about 64s. per sack of 280lbs. The stocks at Paris were reduced to about 18,643 quintals. The weather had been cold, wet, and unfavourable for the blooming, which was going on in some departments.

In the United States rather increased supplies have come forward from the interior, and prices have somewhat given way for flour; but the best brands had commanded 10 dollars per barrel—equal to 42s. 6d. per barrel, being its present value in Mark-lane. In wheat there was no variation. There has been a good demand for Indian corn, but, with abundant supplies of late, prices have receded 3 c. to 4 c. per bushel on yellow and mixed. At Philadelphia a slight decline had been submitted to for wheat: prime Pennsylvania red was worth 2 d. 60 c. per bushel; white, 2 d. 65 c., equal to 86s. to 88s. per imp. qr. free on board. The receipts of Indian Corn were light, but the demand was mainly for the coast. The sales of the week amounted to 30,000 bushels, at 1 d. 9 c., about 33s. per qr. free on board. At Chicago the receipts of wheat were large, and 100,000 qrs. were then in store; prices ranged from 63s. to 67s. per qr., but the freights were still 7s. per qr. to New York.

Our advices with respect to the crops are of a diversified character; but, on the whole, there has been much improvement since the very favourable change in the weather took place, and on all the heavy soils the appearance of the wheat plant is strong and healthy. Most accounts agree in stating it to have assumed a dark and deep green colour, which may indicate a little danger rather than prove its excellence, as we think it is in this position more susceptible of mildew, particularly if a little untoward weather is experienced during the month of July. As regards the time of bursting into ear, that is certainly late: a few fields only were fully out in the earliest districts the last week of the month, and a late harvest is consequently pretty certain: some early patches may be ready about the third week in August; but the cutting cannot be general until the beginning of September, and that is a precarious month, particularly for the late and northern counties. The many cold nights up to the 23rd of June will most probably cause the ears to be short. The blooming time is now approaching, and this will be watched with great anxiety by all parties interested in the trade. So much this year depending on a good crop, from the exhausted stocks in the hands of both merchants and farmers, those holding any will most probably have many good opportunities of getting out before new grain can be brought to market.

The light soils are not so promising, and these are likely to yield but poorly. It would be well for the country if we were blessed with such super-

abundance as last year; but there is no promise of this at the present moment, and if a fair average crop be secured, we must be thankful for this great blessing.

Barley bids fair to be a good crop, and this article is as forward as wheat, and will most probably be ready at the same time. Spring-sown beans are pretty promising; but winter-planted are this year a failure, from the extreme severity of the weather up to a late period of spring. There will be a good crop of oats, and they promise to be ready as early as any other grain.

Grass has increased during the month, the rain coming in time to be very serviceable, and the hay harvest round the metropolis will be very general the first week in July, having been partially commenced the last week in June; a short crop, however, is universally reckoned on, and high prices seem pretty certain for another season. Turnips have grown slowly from the frequent slight frosts and cold nights; but are now going on somewhat better than they did up to the middle of the month.

CURRENCY PER IMPERIAL MEASURE.

Shillings per Quarter.

Wheat, Essex and Kent, white	75	to	77	extra	79	83
Ditto, red.....	69		72	„	75	76
Norfolk, Lincoln. and Yorksh., red	70		72	„	74	75
Barley, malting, new.. 32 33 .... Chevalier..					34	36
Distilling.... 31 34..... Grinding ..					31	33
Malt, Essex, Norfolk, and Suffolk, new	65		66	extra		70
Ditto ditto old	66		68	„		70
Kingston, Ware, and town made, new	70		71	„		72
Ditto ditto old	68		70	„		71
Rye	—		—		40	43
Oats, English feed.. 26 27 ..... Potato..					27	30
Scotch feed, new 29 30, old 33 34 .. Potato					33	34
Irish feed, white	25		26	fine		28
Ditto, black	24		26	„		27
Beans, Mazagan.....	38		40	„	40	41
Ticks.....	39		43	„	42	43
Harrow.....	39		42	„	42	44
Pigeon	42		47	„	47	48
Peas, white boilers 42 47.. Maple 40 42				Grey	37	40
Flour, town made, per sack of 280 lbs.	—		—		65	70
Households, Town 64s. 65s. Country			—		56	58
Norfolk and Suffolk, ex-ship	—		—		51	53

FOREIGN GRAIN.

Shillings per Quarter

Wheat, Dantzic, mixed.. 84 to 85 high mixed	—				87	extra 92
Konigsberg .....78 80 „	—				85	„ 86
Rostock, new .....78 80 fine					85	„ 89
American, white .... 80 85 red					75	77
Pomera., Meckbg., and Uckermk., red	78		79	extra	78	81
Silesian..... „	75		77	white	79	81
Danish and Holstein ..... „	68		74	„	74	78
Rhine and Belgium..... „	—		—	old	—	—
Odessa, St. Petersburg and Riga..	70		71	fine	73	75
Barley, grinding 29 33 ..... Distilling..					32	34
Oats, Dutch, brew, and Polands 29s. to 30s. Feed ..					27	28
Danish & Swedish feed 27s. to 28s. Stralsund					28	29
Russian..... 28 30 ..... French..					none	
Beans, Friesland and Holstein.....					42	43
Konigsberg .. 39 43 ..... Egyptian ..					37	38
Peas, feeding 39	40	fine boilers			43	45
Indian Corn, white 47	48	yellow			47	50
Flour, French, per sack..... 58	61	Spanish			59	60
American, sour, per barrel 38	39	sweet			40	44

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
May 12, 1855..	73	4	31	10	26	11	40	9	43	2	40	2
May 19, 1855..	76	1	32	5	27	9	44	3	44	5	42	4
May 26, 1855..	76	10	32	11	28	1	44	5	45	2	40	3
June 2, 1855..	77	7	33	2	28	2	44	7	46	4	42	3
June 9, 1855..	77	5	33	11	28	10	47	4	46	1	42	1
June 16, 1855..	77	5	34	1	28	7	45	10	46	6	43	6
Aggregate average of last six weeks	76	5	33	0	28	1	44	6	45	3	41	9
Comparative avge. same time last year	78	9	37	1	29	9	50	3	49	3	46	6
Duties	1	0	1	0	1	0	1	0	1	0	1	0

HOP MARKET.

BOROUGH, Monday, June 25.

We have had no material alteration in our market during the past week. The business transacted is moderate, being confined to the immediate requirements of consumers; and the currency remains firm, at the quotations of our last report.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Monday, June 25.

During the past week the arrivals coastwise have been limited, and an advance in price has been obtained for all sorts. There has been about 50 tons new potatoes from Lisbon this week.

The following are this day's quotations:—

	s.	d.	s.	d.
Yorkshire Regents	150	0 to	180	0
East Lothian do.	120	0 —	140	0
Perth, Fife, Forfarshire ditto..	120	0 —	140	0
Reds and Cups	90	0 —	130	0
Lisbon Whites	£17	0 —	£18	0

BOROUGH AND SPITALFIELDS.

Monday, June 25.

The arrivals of potatoes since Monday last have been moderate for the time of year. Selected samples are steady, at very full prices; but inferior qualities are a dull sale. York Regents, 120s. to 150s.; Essex and Kent ditto, 120s. to 130s.; Scotch ditto, 110s. to 120s.; ditto Cups, 100s. to 110s.; Blues, 90s. to 100s.; Lincolns, 100s. to 115s. per ton.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	*Cheese, per cwt.*	s.	s.
Friesland	88 *to*	92	*Cheshire*	70 *to*	80
Kiel.....	90	94	*Cheddar*	68	80
Dorset, new	98	102	*Double Gloucester*	68	74
Carlow	90	100	*Single do.* ..	56	70
Waterford	88	94	*Hams, York* ....*new*	78	90
Cork, new	84	98	*Westmoreland.* „	76	86
Limerick	..	..	*Irish* ..... „	70	80
Sligo	..	..	*Bacon, Wilts., dried..*	78	80
Fresh, per doz. 12s. 0d.	13s. 0d.		*Irish, green*....	70	74

WOOL MARKET.

BRITISH WOOL TRADE.

LONDON, June 25.—Our market still keeps very firm, owing in some measure to the short stocks held by the buyers, and the low value and great abundance of money. The business doing since Monday last has been rather extensive, and in some instances that day's prices have been exceeded.

	s.	d.		s.	d.
Down tegs	1	0	*to*	1	1
Down ewes.....	0	11	—	1	0½
Half-bred hogs.....	0	11½	—	1	0
Half-bred wethers	0	11	—	1	0
Kent fleeces	1	0	—	1	1
Leicester fleeces.....	0	11½	—	1	0
Combing skins	0	10	—	1	0½
Flannel wool	1	0	—	1	2
Blanket wool	0	8	—	1	0

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THE FARMER'S MAGAZINE.

AUGUST, 1855.

PLATE I.

A SHORT-HORNED YEARLING BULL,

BRED BY AND THE PROPERTY OF CHARLES TOWNELEY, ESQ., OF TOWNELEY PARK, BURNLEY,

For which the first prize of Twenty Sovereigns was awarded at the meeting of the Yorkshire Agricultural Society held at Ripon, 1854.

PLATE II.

A PEN OF PIGS OF THE SMALL BREED,

THE PROPERTY OF ROBERT HARRISON WATSON, ESQ., OF BOLTON PARK, NEAR WIGTON, CUMBERLAND,

For which the first prize of Ten Sovereigns and Silver Medal as breeder, were awarded at the Birmingham Cattle Show, December, 1854.

THE POOR HEATH SOILS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

It is chiefly in periods when very remunerative prices are obtained for agricultural produce that the attempt to improve the poor heath soils of England can be successfully undertaken. The southern farmer who has recently paid a visit to Carlisle will have passed over many such districts of poor heaths as those to which I allude. The Dorsetshire and Hampshire Heaths between Dorchester and Southampton, the Bagshot Heath soils of Surrey, those of Nottinghamshire, and Lancashire, are all comprehended in the poor heath soils of England—districts which have for ages, it is true, been diminishing in extent, but which are, I feel convinced, still much larger than they would be, if they were —by the addition to them of earths of which they are naturally deficient — permanently improved. Davy long since gave the analysis of one of the poorest of these, Bagshot Heath. He found, in 400 parts—

	Parts.
Coarse silicious sand	380
Fine sand	9
Iron, clay, and chalk	11
	400

The improvement of the heath land of the counties of Dorset and Hants has recently attracted the attention of Mr. J. Trimmer (*Jour. Roy. Ag. Soc.*, vol. xvi., p. 131), and he has directed his inquiries with some industry, chiefly to the only permanent mode of improving such soils by their admixture with the adjoining strata, or with the small veins of clay and marl with which they are very commonly intersected. Such veins are found in the soils around Poole Harbour, which are ex-

tensive harsh, hungry, undrained gravels. Mr. Trimmer gives the analysis by Professor Way of two specimens of the clay of Branksea Island, near Poole. They contained in 100 parts—

	White Clay.	Black Clay.
Silica	65.49	72.23
Alumina	21.28	23.25
Oxides of iron	1.26	2.54
Alkalies and alkaline earths	7.25	1.78
Sulphate of lime	4.72	—

It is not very certain, however, that these clay veins are profitably available as dressings for the gravelly heaths; the evidence, on the contrary, rather tends to support the conclusion that, without a large proportion of carbonate of lime is present in the marls applied to these lands, the benefit experienced is not very considerable. The information collected by Mr. Trimmer supports this idea. He remarks:—

"I also heard of instances in which the Barton clay of the Middle Bagshots had been tried as a dressing for the neighbouring light soils; but the reports of its effects were by no means favourable. The marls of the freshwater series were considered preferable, even brought from a greater distance. The clay, however, was used alone; if it had been mixed with chalk or lime the results would probably have been different. The clay and marl which have wrought such a change in the poor soils of Norfolk, raising them from an annual value of less than 3s. an acre to more than 20s., consist either of simple chalk, or a natural mixture, in varying proportions, of clay and fragmentary chalk.

"Some of the agriculturists of Hampshire and Dorsetshire, to whom I communicated these views, expressed an intention of trying the experiments which I recommended; but in the localities where the clays of the Lower Bagshots are most abundant, and most easily obtainable, great doubts were in general entertained respecting their value for the improvement of the soil; and a preference was expressed for the 'fat' marls of the New Forest, with regrets that they were not accessible."

It is of the first importance, however, to those who intend to use marls, that their chemical composition should be ascertained; for, as Mr. Trimmer adds, "the marl series consists of a number of alternating strata, which it is very evident to the eye differ as to the proportions of argillaceous, calcareous, and silicious matter which they contain; and an accurate knowledge of the constituents of each is very desirable. In practice, two kinds of these marls are recognised in the neighbourhood of the Forest—'shell-marl' and 'cherry-marl.' The former consists of clay, rendered calcareous by the presence of shells, whole or only slightly broken. In the cherry-marl the argillaceous and calcareous matters are more intimately blended, and the latter consists of shells vary finely comminuted. Its local name originated in some red streaks of oxide of iron, which are often present in it.

"Much difference of opinion exists as to the relative merits of these two varieties as a manure. The prevalent feeling appears to be, that the cherry-marl lasts the longest, but that the shell-marl produces the earliest effects. From the bones of mammals and reptiles which have been found in some of the beds, I thought it probable that some of them might contain phosphates, and others not. Under this impression, I submitted some of the specimens of the favourite cherry-marl to the examination of Dr. Playfair; but he found nothing to justify an opinion that the difference is traceable to that cause. He found only argillaceous and calcareous matter. This discordance of opinion on the subject of claying and marling is not confined to this district, where the use of these mineral manures is of very limited extent: it is equally prevalent in Norfolk, where it has been long established and extensively adopted. On clay loams derived from the boulder clay, that clay, being composed of the wreck of the argillaceous beds of the oolitic and other formations, mixed with fragmentary chalk, is spread at the rate of 70 or 80 loads to the acre, nearly every 30 years, and is considered to 'freshen the ground,' though the cultivators of such soils are shallow ploughers, and dread nothing so much as bringing up an inch of the boulder clay by a deeper furrow than usual. On the other hand, on the very lightest of the sandy loams of another part of Norfolk, I have seen a ferruginous sand spread as a dressing for the young clovers, and was informed that it had been found beneficial."

The varying composition of marls is a fact that can hardly be too carefully remembered: it is an enquiry full of interest and promise of benefit to the cultivator. I will give an instance or two of the result of such enquiries. A specimen of a very fertilizing marl, from one of Mr. Paine's pits at Farnham, in Surrey, was found by Professor Way to contain, per cent.:

Organic matter	4.59
Phosphate of lime	4.47
Magnesia	1.70
Carbonate of lime	8.00
Alumina	9.10
Protoxide of iron, with a little peroxide	7.99
Sand, quite white	47.23
Soluble silica	16.12

Some marls from Applecross, and Assynt, in Sutherlandshire, analyzed by Professor Anderson, were found to be of a very different chemical com-

position. He found, in 100 parts of each (*Trans. High. Soc.*, 1852, p. 226):

	Applecross.	Assynt.
Silica	0.87	1.51
Alumina and peroxide of iron	0.32	1.46
Carbonate of lime	96.13	82.21
Carbonate of magnesia	1.75	12.69
Alkaline salts	..	0.86
Organic matter	..	0.40
Water	0.37	1.16

These marls are of the ordinary class so widely dispersed over this island: others, like some of those in the valley of the Severn, are of a more composite character.

The analysis of the red marl of Aust Cliff (where the vein is 121 feet thick) was some time since given by Sir Henry de la Beche (*Journ. Roy. Ag. Soc.*, vol. xi., p. 125). 100 parts of this variety of the marls of the Vale of Severn contain:

Silica	48.69
Protoxide of iron	4.79
Peroxide of iron	9.09
Alumina	8.77
Lime	8.68
Magnesia	0.94
Soda	0.53
Potash	3.15
Phosphoric acid & chlorine	traces
Sulphuric acid	0.27
Carbonic acid	8.56
Organic matter	1.18
Water, and loss	4.25

The way in which marls are formed would suggest, from their diluvial origin, the finely-divided nature of their composition. Washed down from highlands into the adjoining valleys, and gradually deposited from the turbid waters in some collection of still waters, they naturally abound in the richer earthy and saline portions of the soils from whence they have been removed. A marl of this kind was obtained, after drainage, from Kinghorn Loch. The bottom of the lake, in one part, was found covered with a thick deposit of a white marl; and over the whole of the rest, a fine black matter had accumulated. These contained, according to Dr. Anderson (*Ibid*, p. 227):

	Marl.	Black Matter.
Silica	0.316	82.296
Alumina and peroxide of iron	2.027	8.654
Carbonate of lime	94.594	1.326
Carbonate of magnesia	1.634	2.996
Magnesia	0.865	0.384
Organic matter	0.360	4.344

It is from such valuable chemical researches that the farmer will feel convinced that the poor heath soils are not in any case hopelessly barren. Their deficiency in alumina or carbonate of lime, he may be well assured, is commonly the cause of their poverty; and the owner of such lands will hence be led to enquire as to the best mode of supplying nature's deficiencies. When we are thus striving to improve her doings, may we not, in following her footsteps, be led to derive valuable hints from tracing her operations? Does she not employ *water* as her great agent in the transportation of soils? How were the richest diluvial soils formed, but by the action of the flood-waters? and how did the owners of the rich warp lands of the north of England create those fertile soils, but by directing torrents of muddy water on to barren fields? Is not still more to be done in this way, not only by merely rendering available turbid natural waters, but by *forming* them in suitable situations, by the aid of the steam engine, and then, after mechanically suspending in the water as large an amount of marly matters as possible, directing these turbid waters on to the surface of the perhaps distant field on which it is desired to deposit the fertilizing earths? I have long been impressed with the very considerable benefit which agriculture has yet to attain from the employment of the steam engine in the irrigation of land; and I feel well assured that, in certain situations, the conveyance of one kind of soil on to the surface of other and perhaps distant lands may be in this way readily and beneficially accomplished.

THE RAIN GAUGE: ITS CONSTRUCTION AND USES.

BY J. TOWERS, M.R.A.S., H.S., ETC.

Those meteorologists whose attention is devoted to the indications of the barometer and thermometer, particularly in connexion with atmospheric electricity, can scarcely fail to be much interested in perusing the article on "Rain Falls," at pp. 468-9 of the June number of this magazine. The catalogue there given of the eleven years, 1844 to 1854, both inclusive, comprises (notwithstanding discrepancies) 23 9-11ths, or in round numbers 24 inches, as the average yearly rain-fall in London and the surrounding metropolitan counties. We know that far greater differences exist in several of

the remote counties, west, north, and east; but not to dwell upon them, or indeed upon the chemistry of rain, we restrict our inquiry to the volume of water which may fall in any given locality, and to the instrument by which that volume is ascertainable.

In consequence of the sanitary measures that had been adopted by the local Board of Health at Croydon, it became an object of importance to know the quantity of rain that might fall at any time in that reputedly dry and healthy locality; and after a great variety of experiments and calculations, the rain gauge now to be described is recommended, as combining the essentials of simplicity and economy.

We must start with a first principle as the basis upon which everything should be founded. All the reports given upon rain-falls are calculated by cubic inches, and their decimal tenths and hundredth parts. Now a cubic inch of rain-water at 62 degs., Fahrenheit's scale, is stated to weigh 252.45 grains; but in nine cases out of ten, the rain that falls is below that temperature, or nearer 55 degs.: therefore 252.5 grains, *i. e.*, 252½ grains is preferred as a standard. A simple gauge for 1 cubic inch is obtained by balancing a half-ounce phial, then adding 252½ grains, and passing rain water into the phial till it precisely balances all the weights: the water-level may then be accurately marked by a sharp triangular file or diamond. Measures should be provided; and such are the 1 to 8 ounce glasses kept by dispensing chemists. They are graduated in drachms, half-ounces, ounces, &c. It is fortunate that the 4 drachms, or ½ ounce line of every glass corresponds within 5 or 6 drops of the water in the cubic inch gauge. Thus, with a little practice, any usual fall of rain can be measured by these glasses, aided by the cubic ounce phial, which ought also to be divided into tenth-parts—carefully marked on the glass—in order to ascertain the fractions of the cubic inch.

The rain gauge itself consists of a receiving vessel—than which none is better than the wide-mouth bottle used by druggists, capable of holding 2 or 3 pints of water; and of a tin or zinc funnel, accurately made by a clever workman, who can appreciate the intended object. It is usual to adopt the circular conical funnel; but a square one is preferable, because of the great difficulty, or rather impossibility, of "squaring" a circle—that is, of correctly ascertaining the number of its superficial square inches. A square of 8 inches comprises 64; but a circle of the same diameter will yield a lower product, and to arrive at even an approximation the diameter must be multiplied by 3.142, which will give 25.136 inches and 1,000th part as the girth or periphery. I will therefore presume that the following mode of solving this difficult but interesting problem may be safely recommended. It consists in having two funnels, one square, the other circular, each 8 in. in diameter, fitting their pipes firmly within the mouths of the bottles by a soft compress of tape lapped round the tubes till they remain immovable. The bottles being graduated by means of the cubic measure before-mentioned (and marked by a file or diamond into equal parts of from 2 to 4, 8, 12, and so on to 64 cubic inches), are to be sunk to a level with the open ground, in juxtaposition, where each may receive the rain uninterrupted by trees or foliage. But as it will be difficult to remove the bottles from the earth, I prefer to sink a large flower-pot to its rim, and to place each bottle in it, surrounded by a quantity of fine moist sand: thus it can be easily removed from and returned to its position.

In ordinary cases the rain-fall will not require to be measured more than once in the 24 hours (as at 8 o'clock A.M.); but a close continuous rain or thunder-shower may even fill the bottles to an overflew. In such cases a more frequent examination must be made. One considerable advantage is obtained by comparing the results of the square and circular funnels; for if both be employed at the same time, and under precisely similar circumstances, the smaller volume of water collected by the one bottle will almost exactly determine the number of square superficial inches comprised in a circle whose diameter is 8 inches, that of the square funnel being 64 inches.

The situation of the instrument as to altitude is of great consequence; since it has been repeatedly proved that, in any one place, more rain is collected in proportion as it is situated nearer the surface of the ground. In Dr. C. Hutton's Philosophical Dictionary, vol. ii., p. 279, there is a table, showing the results of 12 months' experiments, continued from July, 1766, to July 7, 1767, when there fell in a rain-gauge, fixed

Below the top of a house.	Upon the top.	Upon Westminster Abbey.
Inches.	Inches.	Inches.
22.608	18.139	12.099

Whatever may be the proximate cause that produces falling drops of rain from the watery vapours of the atmosphere, certain it is that the ground, which is the receiving surface, ought to be considered, the situation on or close to which a rain-gauge should be stationed.

Croydon.

AGRICULTURAL STATISTICS.

In our report of the recent agricultural gathering in Suffolk, we had with pleasure to remark on the very excellent and serviceable addresses with which the business of the day concluded. The chief theme of nearly all these was the same. There is a very pertinent question that the English and Scotch farmers may well ask of each other as they meet on the border:—How comes it that the attempt to collect agricultural statistics was so favourably received in Scotland, and so shabbily treated in England? Surely by this we are as free from the influence of any petty prejudice as the best of our friends in the North; while surely, too, if there was any possibility of self-injury from supplying the returns asked, the canny Scot would hardly be the last to perceive it. "Don't answer that question if you think it will tell against yourself," quietly remarks the observant judge, or quickly advises the yet more anxious counsel. It is something of an Englishman's right that he should not be called on to give evidence to his own prejudice.

We trust the farmers of this country know us well enough by this, to recognize us as their own advocate. We hope we have never written a line, or advised any course of action, but was prompted by a regard for their welfare. Had we even for a moment thought that the collection, generally, of the agricultural statistics of this country could be brought to work against them, we should have been the first to arouse their opposition. Our opinion has been to the contrary; and in expressing this, if we can be supposed to injure any one, it is none other than ourselves. It is not too much to assume that as far as agricultural statistics can be at present obtained, they are reached through the agency of this paper. It was only, indeed, in our last week's number, a correspondent, himself hostile to the experiment, compliments us by saying that if it be a question to sell or to hold, "I know no better guide than the prices and the world-wide information contained in your journal."

To hold or sell is something, but this is not all. No one can read the remarks of Lord Stradbroke at the Ipswich meeting without feeling how much the real progress of agriculture may be facilitated by the general collection and publication of these statistics. They must, indeed, have done something already. For instance, they enabled his Lordship at this very meeting to make a comparison between the farming of Norfolk and his own county—Suffolk, that is very suggestive of what may yet be done by the latter. Why should Suffolk be behind in what is good, and only in a majority on what is unprofitable?—proportionately less turnips and less sheep, but six times as much bare fallow, or waste of land. This comparison, be it remembered, would be suggestive of a common application. Bedford might ask it of Cambridge, or Cambridge of Lincoln. Every landowner and every occupier, when he found how much less he was doing than his neighbours, would have to ask the reason why? He would learn not only when to sell, but how much he ought to have to sell—more turnips, more sheep, and less bare fallow.

Sir Fitzroy Kelly, still pursuing the theme, and with some matter more identified with his own position as a public man, referred to the Committee now sitting on this subject. It is one of the House of Lords, and upon which Lord Stradbroke, Lord Berners, and other peers with a known taste for agricultural pursuits, have very properly a place. It is empowered to call evidence, and on this of course a report will be presented. Sir Fitzroy would almost seem to hint what may be expected from it:—"It is certain that unless all, with an equal absence of all reserve, concur in making the returns for the public good and public service, great disadvantage will be incurred by those who do not make accurate returns, while others keep the secret to themselves, and the disadvantage is imposed on those who best perform their duty. Under these circumstances, it is in vain to look for returns of agricultural statistics so long as the voluntary system is resorted to. I believe and admit that we must resort to some legislative measure to effect the great good that must follow from a well considered and established system of agricultural statistics. * * * * * And this might be done with perfect safety if some measure were adopted by the legislature, certainly compulsory in its character, while requiring on the one hand from the farmer fair returns, and, on the other hand, completely securing all the secrecy he requires, and thus preventing all the evils which a public disclosure might produce."

"It is only for the farmers of this country," the honourable member adds, "to notify their readiness to concur in this measure." We believe, as we have before said, that when asked in a proper way, they will concur. We believe the great difference in the results just arrived at in England and Scotland to be almost altogether attributable to the manner in which the thing was carried out.

In Scotland it was exceedingly well done; in England it was just as badly done. The credit of success, in the one case, is entirely with the Highland Society and its secretary, Mr. Hall Maxwell; for the failure in the other, we have no one to blame but the Government. Before this, inquiries have been gone into, and information asked, with the one grand object that the result *should* be a failure. We will not say so here, though such an exhibition of parsimony and indifference, as evinced on a matter of so much national importance, would almost warrant us in doing so.

There are evident signs, however, that the next effort will be a stronger one, as that eventually the collection of Agricultural Statistics will come. We repeat, it is just such a topic that will now bear talking over. It was well talked over at Ipswich.

TOWN SEWAGE—LIQUID MANURE.

We have been informed by a stationer in a retired village in one of the rural districts that he never knew a work, published in numbers, for which he experienced so large a demand as for Professor Johnston's "Chemistry of Common Life." This speaks well for the growing intelligence of the age, and for the cause of industrial progress. If the chemistry of common things were better known, we should be spared the constant repetition of a great deal of argument, in which practice and science are often treated as antagonistic. Whereas, practice is merely the doing of anything in the way in which we have been accustomed to do it; and applied science consists in a knowledge of the principles on which we do it, the reasons why we do it, and the direction in which it is possible to effect improvements in our present methods, be it in agriculture or in anything else. So long as we maintain the position that our present mode of doing anything is perfect, practice reigns supreme; but when we attempt improvements, we must either be under the guidance of blind chance or under the guidance of such general principles as we are able to deduce from the nature and properties of the substances upon which we have to operate. The more extensive and accurate our knowledge of those substances and their properties, the greater will be our command over them.

If the chemistry of so common a thing as the farmers' manure heaps were better known by the majority of those who cultivate the soil, it would obviate the necessity for much of that "ventilating" which the subject of liquidmanure and the application of town sewage at present appears to require. The farmers, for instance, would understand that the same substances exist in the solid, the liquid, and the gaseous form, and that it is only in the two latter conditions that the plants which they cultivate receive the solid manures administered to them.

It is nearly twenty years since the question of the application of town sewage to the land first began to be agitated; and slow indeed has been the advance in that time. Latterly, however, some progress has been made. In the first place we may rank the conviction now attained, that it is hopeless to attempt to reduce the liquid manure of our sewers to the solid form. The admirable papers of Professor Way, in the Journal of the Royal Agricultural Society, to which we referred some months back, have set this question at rest. Another great point gained is the patronage of the distinguished members of the Royal Agricultural Society, who had previously been most opposed to the use of liquid manure. When once it became an established practice among practical men to dissolve guano, brought from another hemisphere, in water; and when it was made a boast that such were the virtues of this mode of application, that the water necessary for the solution of the manure was, in some cases, carted two miles to be distributed by means of the water drill, the key of the position was carried, the battle was virtually won. The question then assumed this form:—Whether, if we had a tank which should contain, not only dissolved guano, but the other ingredients contained in farmyard manure which guano does not contain, it would be most advantageous to cart this liquid two or three miles, and then to distribute it by means of the water drill; or to pump the liquid up by the steam engine, to convey it by these mains many miles into the rural districts, where its value would be greater than in the immediate vicinity of our great cities, and to distribute it by means of a system of smaller pipes, laid under the soil? On this point we have the advantage of an appeal to practice, in the case of the water companies. They raise the water with which they supply our great towns 100 feet, by means of steam power; they send it in mains for many miles to our great towns, and they sell it with a profit, at the rate of 100 tons for £1. The sewage of our towns is nothing but this water, holding in solution nitrates, phosphates, and all the salts which are contained in farmyard manure: it is simply dirty water. Now at the price abovenamed of 100 tons for one pound,

the road contractors, near London, find it more advantageous to purchase water for watering the roads, than to pump it from wells provided for their use by the roadside. This argument was first used by Mr. Chadwick.

The great objection to the plan is that it requires a large capital to be sunk in the steam engine, in tanks, in the mains, and in the smaller distributing pipes. Who, we ask, is to undertake this? Not the farmers certainly; for they in general have no more capital than they require for the ordinary cultivation of the soil. Not the landlords; for they have generally no spare capital. Not, we fear, by town councils levying rates on the towns for the purpose; for it is said there is opposition enough in those bodies already to the rates necessary to pay the annuity required to liquidate the loans taken up for the purpose of constructing sewers. We must resort then to the aid of associated capital of some kind or other. Shall we have an "Association for promoting the Agricultural Application of Sewage;" annual subscription one guinea? or shall we resort to Joint Stock Companies for "Utilising the Sewage of Towns?" We should have no hesitation in giving the preference to the latter of these. Associations for promoting railway travelling would never have constructed the great network of railways which envelops the country; and the same agency which has performed that herculean task, and which has lighted our towns with gas, appears the agency which must clear our towns of their refuse, and convey it to the farmers at those points where it will have the greatest value. Suppose, however, such a company formed. Let the usual stereotyped advertisement be issued, that no further applications for shares will be received after a certain day: when the Company's broker offers shares to some of the City millionaires, the answer he receives will be, that they will consider of it; which means they will inquire about it. They know nothing of the merits of liquid manure, or of solid manure either, for that matter; but they are acquainted with some great authorities in such matters—some large farmers near their country seats, some eminent land-agents, whom they are accustomed to consult when they wish to make a landed investment. Their inquiries are answered by a shrug of the shoulders, or an exclamation of derision. It is needless to add that the City millionaire declines taking any shares in the great London Sewage Company.

If the sewage of our towns is to be utilised, as the phrase goes, we must first get up a liquid-manure party among the farmers themselves; and unless the liquid sewage can be pumped over the land, we must retrace the steps which have been made, by doing away with cesspools, and washing the refuse into our rivers. We may get rid of it, in this way, near the mouths of tidal rivers; but when we pour the refuse of inland towns into the upland waters, we are but removing the seeds of pestilence from the towns to the rural districts. Rugby is a case in point, where an action was brought against the town for polluting the river which flows through it, and from this action they were only extricated by a neighbouring landowner taking a lease of the sewage for the purpose of pumping it over his land.

THE PRODUCTION OF BUTTER.

"The production of butter" discussion was resumed at the Weekly Council meeting of the Royal Agricultural Society, on Wednesday, July 11. The report given under the proceedings of the day will speak very much for itself. Mr. Horsfall has had his rejoinder; and Mr. Horsfall and his practice remain just where we placed them after their first appearance on this stage—as nothing very extraordinary after all. It has been asserted that nothing extraordinary was ever intended. If so, how came we to those wonderful five-and-twenty ounces, as associated with the especial system advocated? The fact is, as he himself honestly admitted on Wednesday, Mr. Horsfall "has no agricultural reputation at stake." He did not know a great many things that he has learnt since this discussion commenced; and amongst them, he did not know that many men of far less pretensions were doing quite as much, or more, in the production of butter than ever he has done. Mr. Horsfall is evidently admitting this; but we really must say, after the flourish with which he had originally been introduced, that we never heard a tamer reply than Mr. Horsfall's to Mr. Scott on Wednesday.

It is rather remarkable to observe, since this inquiry began, how Mr. Horsfall and his friends have shifted their ground. Instead of showing his high-feeding against anything kept, however costly, it is now turning to the relative products of this expensive system, and that of the most ordinary practice. The comparison is in itself an absurdity—without, that is to say, not only the production of the butter, but also of the balance-sheet. Mr. Horsfall, with "no agricultural reputation at stake," must prove his case a vast deal further than he has yet. He must show to those who have not

only a reputation but a living at stake, how much more profitable his method is than their own. We more than doubt his being able to do this; for even as it is, Mr. Scott brings whole averages of dairies, never yet announced as anything wonderful, that approach very closely to his greatest results, while individual cases, as a consequence, must very often excel him.

The production of butter, after all, however, is not Mr. Horsfall's great point: it is the feeding—a question of manure, as we said; a question of condition for the butcher, as Mr. Horsfall puts it. He places but little value on the manure; for he cannot understand the argument of high feeding depending on the manure. There are many, with some agricultural reputation at stake, that do though. Still, let the whole case stand as he puts it. Mr. Horsfall, by an expensive process, obtains perhaps a little more milk than some of his neighbours. He derives little profit from the manure obtained by this expensive process; but his cows go in a better condition to the butcher. Will the result justify the outlay? Will any member of the Royal Agricultural Society, who has heard all Mr. Horsfall has had to say, be prepared to follow him? We doubt it.

Indirectly he has been the means of some good. His own papers have produced others far more valuable and effective; and it is from calling especial attention to these that we do claim some little credit. As Mr. Horsfall himself well observes, in his article of this week, "The conductors of agricultural publications should acquire the means of discriminating and calling attention to such statements as are sound and worthy of approval." Of course they should. It is the very first of all their duties. "Such statements as are *sound* and worthy of approval"—we take it for our motto. Under this banner we fight; and if we wanted any evidence to prove that we *had* acquired, in some degree at least, this "means of discrimination," we would cite what we have said as to the relative merits of Mr. Scott and Mr. Horsfall.

STEAM CULTURE.

No. II.

THE FIXED ENGINE AND PULLEY.

With wire ropes and pulleys the lying shafting and crane would be dispensed with, while the railroad might be of a simpler and less expensive construction. This would not only reduce the expense and increase the effective power of the engine, but also render the carrying out of manure and home the produce of harvest, by steam, possible if not profitable.

These are important differences, deserving of a detailed notice. The auxiliaries which the engine would now require would be some two miles of wire rope or chain, four or more pulleys, the necessary anchorage at each end of the field, and the four-wheeled cultivating machine previously mentioned. But even here we shall meet with some trying difficulties without the aid of a couple of horses for the removal of chains, ropes, &c., from one field to another. Let us first, however, discuss the engine alone.

The first thing in starting would be to get out and fix the anchors and pulleys, and then lay down the driving rope or chain. In effecting this, in the absence of horses, the railway would be serviceable; and by means of ropes of a sufficient strength to drag out the chain, &c., to the opposite end of the field, and back to the engine, the task might be accomplished by manual labour. This done, the cultivating machine could then be attached to the driving chain, drawn along the railway, and from thence along the field.

The driving rope or chain itself would, as has already been said, be two miles long. It would extend, for example, from the drum or pulley of the engine to the extreme of the railway one half mile, supposing we are to commence at the farthest side of the field. After going over one of the pulleys here, it would then extend along the length of the field—another half mile—and be placed over the two pulleys there, nearly close to each other, and from thence be brought back to another pulley at the railway from whence it would return to the engine-house and be locked or spliced to the other end. Thus forming an endless chain, or wire rope, working over five pulleys—four in the field, two at each end, and one at the engine. Along the whole line the chain would thus be double, or two chains, as in the case of all pulley arrangements.

To one of these sides the cultivator would be fixed, and by it drawn to the opposite end, where, by means of leverage or other simple contrivance, it would have to be shifted one breadth nearer the opposite side of the field, and then fixed to the chain again, and drawn back to the railway from whence it started, continuing this alternate crossing, shifting, and re-crossing until the field was finished.

But, as we proceed nearer home or towards the farmery, we shall have spare driving rope. How are we to dispose of it, so as to keep it always at a uniform degree of tension? This can be effected as follows, viz.:—As we proceed nearer home or acquire spare rope, the two pulleys at each end recede from each other. At first they are close together; but at the last

or finishing of the field, they are nearly its breadth asunder. In other words, the outside pair nearly remain stationary; so that, when finishing the field, it is entirely surrounded with the rope. We have two miles of a rope, it will be recollected—one mile going out, as it were, and another mile coming in. Now, the field being a square, whose sides are one-half a mile each, gives us two miles as the sum of the sides, equal to the length of the rope; moreover, this surrounding of the field is absolutely necessary to enable us to cultivate the headlands, for the machine cannot cultivate the last inch of land, a certain space being required to turn upon. In cultivating the headlands, the anchor to which the machine was moving would not resist the force against it, unless special provision was made in its construction and fixing in the soil; indeed, all of them would be similarly circumstanced, the strain not being in the direction of either line of rope, but diagonally between them, whether cultivating the headlands or not; but provision of this kind could easily be made.

With three miles of a rope, another plan somewhat different might be adopted. In this case, the ends of the rope would be fixed to a drum at the engine. There would always be one mile wound up on the drum; and in working, the rope would always be winding and unwinding as the machine was alternately moving from one end of the field to the other, while there need not be more than three pulleys in the field, and only two anchors.

Seed and manure drills, harrows, rollers, clod crushers, and implements of this kind would be drawn in the same manner. During winter the farmer might wish to turn up his soil so as to expose it in the greatest degree to the influence of the frost, and hence leave it in a rough or non-pulverised state; but in spring, or during seed-time, the object would be to finish the digging or ploughing, sowing, and harrowing at one time, so as to save the going over the field a second time. Upon economical data of this kind much of the success of steam culture will depend.

Mowing, haymaking, and reaping machines could also be made, so as to be drawn alternately along the field, or with an additional anchor and pulley, in any direction, longitudinally, laterally, or diagonally, as the wind or state of the crops may require.

The motion, we have said, would be reciprocating, not continuous; and in controlling this reverse action, the engineer at the engine would have to be guided by some telegraphic communication or signals from the field. Three men, for example, would at least be required in the field—one at each end to shift the anchors, and one to attend the cultivating, sowing, mowing, or reaping machine, who could easily signal the other at the engine by means of a small flag, analogous to what is done on railways.

In this case we may with more certainty calculate on a speed of one mile per hour with a machine covering two yards in breadth; and that four or five men, with a fixed engine of sufficient power, would finish at this season nearly ten acres per day. But although they did not come up to this result on some soils of a stubborn character, they may nevertheless do as much as the teams required to work such a farm, viz., six acres; thus effecting a saving of the food consumed by twelve horses, besides the tear and wear on horse-flesh, which, in a national sense, would be of inestimable value, although the direct profits to the farmer may be nominally little.

In reference to the last two sentences just stated, it may be laid down as a general rule, that agricultural prosperity is dependent upon the general prosperity of the country; and, that although exceptions exist, they are so few and unimportant, compared with the opposite, as to have no weight on the great question at issue. We shall postpone the elucidation of this question in reference to the national benefits of steam culture, in the hope of doing it more justice in a separate article; meantime shall only add the somewhat paradoxical proposition that steam culture, though more expensive to the farmer than horse culture in the first place or directly, may yet indirectly be the cheapest.

Our next problem for solution is, with a fixed steam-engine in the centre of the farm, to perform the cart-work by means of ropes and pulleys. Manure, for instance, has to be carted, or at least applied to the field, the produce brought from thence to the farmery, and, after being manufactured into bread-corn, dairy produce, and butcher-meat, has to be sent to a distant market, minus what is consumed by the farmer and his engineering staff at home. How is this to be accomplished?

With regard to manure, two plans are proposed. First, by means of the engine, water-tanks, pipes, hydrants, and hose, to apply it in a liquid form; thus obviating the labour of carting. Our readers are so familiar with this plan, that even a condensed account of it would be superfluous.

The second plan, carting-out manure by means of a fixed engine, waggons, ropes, and pulleys, is, perhaps, not so well understood. In its details it exhibits considerable diversity, owing to many kinds of manure in use, different kinds of waggons proposed, and the equally diversified circumstances of the soil.

Artificial manures have already been disposed of under seeding the ground, such being drilled in along with the seed, or at the same operation. The carting-out of farm-yard manure, clay upon sandy land, and sand upon heavy clays, are works of a different nature, involving very wide differences of detail in their performance in the field. It is, no doubt, possible to apply and plough-in farm-yard manure at one operation, or going over the field; but, granting that it were so, it would not always be prudent or judicious thus to apply it when the land was being ploughed. For the most part, they would have to be applied separately; a work which would engage the exclusive use of the engine, &c., &c., unless by some means not yet considered we can divide its power, as subsequently noticed.

In this case we have the different operations of loading the waggons in the dung-yard, taking them to the field, emptying them and spreading their contents evenly

upon its surface, and the bringing home the empty waggons, all which operations must go on continuously at one time, in order to comply with the demands of successful practice. And besides this, every farmer also knows that the manure should be spread and ploughed in as fast as it is carted-out. These are the practical questions which have to be solved before success can attend steam-culture as proposed.

The mere carting-out and spreading of the manure is a simple affair, but the ploughing of it into the ground at the same time is surrounded with more difficulty, owing to the concentration of the motive power, and the circumstances of the soil and manure.

In the carting-out only, as in the case of clay, sand, chalk, and other materials of this kind which would not waste by exposure, we have only to fix an anchor and pulley in the clay, sand, or chalk pit, with the necessary complement of anchors and pulleys in the field, when the loaded waggons could be taken to the field by one side of the wire rope, and the empty ones returned by the other. So far is plain sailing, with nothing to prevent a successful issue. In going over the field, these articles could be spread from the waggons without stoppages, as in the case of carting with horses.

In ploughing-in manure as fast as carried to the field and spread, the farmer divides his teams and hands; can he not divide the power of his engine in the same manner, so as to obtain a similar result? Can he attach to one side of the rope a machine with four ploughs covering one yard, and on the other a waggon with manure sufficient for 880 superficial yards, or one yard the whole length of the field? Or, what amounts to the same thing, can he cover in manure on one side of the rope as fast as he can carry it out on the other side?

In answering this question, it will be observed that the waggons return empty; so that, in going up the field loaded, the ploughs could be empty also, as they could cover in the manure in returning with the empty waggons. This, while it would equalise the draught to the engine, would also enable the hands in attendance upon the ploughs and waggon to bring their whole efforts more effectually to bear upon the spreading and covering of the manure; going up the field, for instance, their whole attention would be engrossed with the spreading, and in returning with the covering.

Of the practicability of carting out and covering in manure this way—by two separate and distinct operations, and yet at the same time—few will question who have any experience in Fowler's Draining Plough. Whether we shall subsequently find preferable plans in operation by farmers or contemplated by inventors, is a question we are not now discussing: at present we are confining our observations to what can be done by a fixed steam-engine, with anchors, ropes, and pulleys; and there can be little doubt that by such mechanical means plenty of manure can be applied to the soil, and covered in, with a degree of regularity only to be found in our large manufactories, where the whole is kept in motion by the untiring energy of steam.

With regard to different kinds of waggons, two propositions—those of Crosskill and Boydell—are deserving of special notice. The former is a moveable railway, so constructed as to be adapted for any kind of wheels; so that if the railway of which we have so often had occasion to mention were constructed on this principle, a common waggon could be drawn along it without much increasing the draught of the engine. While a waggon-load of manure, for instance, was being drawn up the field, an empty waggon could at the same time be drawn along this railway to the dunghill in the covered homestead; and when the empty waggon was being returned from the opposite headland, and the manure was being covered, another loaded waggon could be brought to the field from the dunghill without adding much to the draught of the engine. Of the importance of this auxiliary there cannot be a doubt.

Boydell, on the other hand, carries an "endless railway" on the periphery of his wheels; so that with his waggons no additional rail intersecting the farm would be required. With a waggon of this kind, four horses can draw easily four tons of manure over newly-ploughed land, where the common waggon would sink to the axle and remain immovable behind four times the number of horses. Wheels of this kind have been tested by Government at Woolwich, with a weight of upwards of six tons, in the soft marshes during winter; and the ease with which they were drawn—not only over the soft ground, but ditches and irregularities purposely thrown in the way—astonished everybody. They are only adapted for slow motion, such as four miles and under per hour, as beyond this speed the centrifugal force prevents the rails acting and falling in their places; but this, it will be seen, is just the qualification which a fixed steam-engine requires. And there cannot be a doubt of the value of the combination; as with them a waggon could easily carry along newly-ploughed land (or land ready for manure) a load sufficient for a good dose to 880 yards of land, or a ridge one yard wide of a square field of 160 acres.

The circumstances of the soil, our last proposition, are many more than we can notice at present. We have been supposing the lands square and the fields level, while both are the exception, unlevel and shapeless fields being the rule. It is, however, a very shapeless field that a rope will not surround, and a very unlevel one that cannot be so divided that by means of anchors, pulleys, and a few friction rollers, every division of it cannot be brought under the subjection of steam. All that is necessary to overcome obstacles of this kind is a little engineering; for, however great, they are not in reality greater than with horse power. The practical question is, that with steam culture lands would be more judiciously subdivided, and homesteads placed so as to overcome the principal objections here involved.

With regard to carrying in harvest, whether hay, corn, or root crops, the work, as we have already said of carting clay, chalk, &c., would be plain sailing. From the arbitrary operation of steam and wire ropes, things would no doubt have to be more methodically conducted than they sometimes are with horses. Fields, for example, would have to be cleared from end to end, and

side to side, as much as possible; but the operations of seed-time and harvest, if properly attended to, would so harmonize together as to conduce to this result.

Our next topic is cultivating land by wind or water as the motive power. If steam can perform this, so can they.

CANCEROUS GROWTHS ON CATTLE.

Sir, — Some time back I gave in your journal several instances of cancer occurring to horned cattle, and promised, when cases of that description came in my practice, to resume the subject. Having had several since the time I wrote, I think it not only my duty to fulfil the promise by relating the cases as they have occurred, but also to describe the treatment adopted.

First. A heifer, near two years old, had one calf, and milking, I purchased of a neighbour, Mr. W. Flower. Case: occult cancer, the incipient stage; situation of tumour, parotid gland; moveable, with a particular hardness, accompanied with some little soreness, yet so little scarcely to be painful by outward pressure; the inward, or rather deep-seated, hold it had taken on the upper part of the throat pressed upon the larynx, causing a short irritating cough, impeding respiration, accompanied with a dull sonorous sound. In the space of a few weeks the tumour had made rapid growth inwardly; the breathing and cough became more considerable. The owner, alarmed, took the opinion of a resident cow doctor, who declared the animal to be in a rapid consumption. Remonstrance on my part on the absurdity of such a thing was of no avail, the cough and emaciated frame favoured the erroneous decision of the empiric, and all hopes of recovery had vanished, and her provident owner determined her to die, or go to kennels. I tendered a £5 note, which was quickly accepted, and she was immediately removed to my premises. Treatment: saline laxatives, combined with the hydriodate of potash; mild blisters, with iodine; no amendment. I then had recourse to the ointment of hydriodate of potash, occasionally combined with mercurial ointment, daily rubbing; tumour advancing, breathing difficult, deep roaring, and dull; the larynx so much compressed that the eyes became glaring, fixed, and prominent. Determined on a full trial of the iodines, internally and externally, I left my patient to struggle on day by day with much distress. No influence occurring from the agency of the applications, suffocation threatening immediate destruction, I plunged a scalpel into the trachea, placed therein a tube for her to breathe through, as at this time the wind-pipe on the larynx part had become very nigh closed: I allowed the tube to remain until she had acquired strength sufficient for the operation of excision. I cut out the tumour, in weight from three to four ounces, and so hard had it become, that I was obliged to change two or three of the late Long's scalpels. My patient was immediately relieved; the tracheal tube removed, her breathing became natural in a short course of time, a return of health succeeded, flesh and milk increased, and the consumption fled; and in due time, I expect her to present me with a calf for my trouble.

Second case—a heifer, had one calf, belonging to Mr. Smith, of Eastfield. Gland the same; tumour estimated (not weighed) three pounds. Treatment, the iodines; knife the remedy. Got quite well, and fattened for the butcher, making herself a beautiful animal.

Third case—Mr. Sidwell, Harworth. Heifer, tumour of the same kind, spreading itself widely on the exterior surfaces, with ligamentous bands attaching to the angle of the maxillary bone, with large tortuous veins ramifying over the tumour. Treatment, the iodines, mercurials, &c.; no effect, tumour enlarging, and the ulcerative process having commenced on the 17th of April last, I excised the tumour. The specimen is complete, and stands in my surgery; the animal is now quite cured, the wound having closed. Although the iodines have failed in these chronic enlargements, which were of long standing, yet they are invaluable agents, and importantly so in many affections of glandular structure, and in their action simple and combined. I have found more satisfaction than disappointment. I am not aware of any other agent which might produce any better results upon such morbid growths, and I think it will be pretty evident to most that the knife is the speediest, safest, and best. Caustics are slow and painful, compared with the scalpel. I have a case under treatment, where the tumour is fixed to the humerus, near its articulation with the scapula, and in this instance I have passed a seton near its base, dressing with ointment containing arsenious acid—a most powerful caustic. Yet I am disposed to conclude, from present appearances, that the knife ultimately must be the remedy. Although I can apply, in this situation, a caustic of severity, not fearing the deep sloughings which may follow, as in throat affections.

The next article I send will be on the Æstris bovis, or gad fly, with the effects produced on the animal system, with the names of the owners of such cattle that have suffered from their inflictions.

Your kindness in giving this a place in your invaluable journal, will greatly oblige.

Yours obediently,

Tickhill, May 11th, 1855. C. Sayles.

CAN A SUBSTITUTE OF EQUAL VALUE BE FOUND FOR GUANO?

Sir,—In a former number of your journal is a valuable paper on the Guano Trade, showing the extent and importance it has assumed in our agriculture and commerce, and speculating upon the probable extent of the deposits still available. So essential has this manure now become, so universal is its use, and so dependent is the farmer upon a supply of it for obtaining the greatest possible produce from his land, that the demand for it will, in all probability increase to an indefinite extent rather than diminish, and be spread over a larger portion of the civilized world. It is, therefore, of the first importance to ascertain whether the deposits of guano still remaining, are adequate to the enormous consumption which will in future press upon it; and if not, whether a substitute of equal value can be found, of such a character and composition as to afford an inexhaustible or continuous supply. These two questions I propose to consider in my present letter.

With regard to the first question, namely, the proportion between the stock of guano and the annual consumption, there can be no doubt but many islands will yet be discovered, containing large deposits of this manure, especially on the west coast of South America. It is recorded in Acosta's "Naturall and Moral Historie of the Indies," that when the Spaniards first discovered Peru, they found the half-civilized nations using this substance in manuring their land, which they had practised time out of mind, obtaining it from the very islands which are now resorted to by the English and American ships. They have doubtless used the same to a much greater extent during the three centuries which have intervened since that period, and under the Spanish rule; and were its use confined, as heretofore, to that country, the supply would undoubtedly be inexhaustible. Instead of this, however, it is now spread over a large portion of the civilized world, it is applied to every kind of agricultural produce, and its consumption is daily increasing.

I see, by the paper referred to, that the surveyor, under the Peruvian Government, estimates the quantity at the Chincha and Chipana Islands at 27 million tons; but the *Shipping Gazette* writer, considering this estimate as vague and fallacious, reduces the amount to 12 millions of *good* guano, which is probably nearer the mark. Mr. Peacock adds to this 8 or 10 millions on the Lobos and other islands. On the other hand, the future deposits will now be removed from thence, by the disturbance of the sea fowl, to other islands, or rocky promontories on the continent. But it will require a long series of years before a quantity worthy of commercial attention will be accumulated on any fresh spot; and therefore a prospect of a supply from that source is not immediately available. The coast of Africa, however, affords a hope that some quantity may be obtained from the islands and promontories of that continent, the quality of which may be equal to that of Peru. The deposits there, however, do not appear to be near so dense as those of the Chincha Islands, &c. Ichaboe, I believe, is already exhausted, or the quality of what remains is so inferior as to be scarcely worth bringing home. If we reckon, therefore, what is found in those seas at two million tons, I think we allow the utmost. Adding this to the twelve million tons of the Chinchas, and the ten million tons of the Lobos, &c., Islands, we have twenty-four million tons available for commerce at the present moment.

What, then, is the proportion this quantity bears to the future demand? This is a question impossible to answer with anything approaching to certainty; but we do know that the consumption is annually increasing, both in the Old World and the New—that in the West Indies it is found of the most inestimable value in cane cultivation—that on the eastern seaboard of the American continent, where the land has been exhausted by a severe system of agriculture, it is now eagerly sought after as a renovator—that in England, as well as France and other continental countries, it is found to be the cheapest and best manure they can apply—and that consequently the consumption is rapidly on the increase, and it is likely to supersede all other condensed manures hitherto discovered.

It appears that in the twelve years since guano has been imported into Europe, the quantity brought into the United Kingdom is about one-and-a-half million tons, or rather more than 100,000 tons per annum. The present consumption is from 300,000 to 320,000 tons; and if the demand goes on increasing as it has done of late, it is probable that in five or six years the quantity will reach half a million. The same increase will be likely to take place in other countries where it is used, so that in a few years the annual demand will amount to two million tons; and thus, unless large deposits are discovered, *or a substitute found of equal value as a manure*, the stock at present known will be exhausted in twelve or fourteen years.

Fortunately the latter desideratum has been discovered, and it is to this that I shall now apply myself. In your paper of the 20th of November last there appeared a translation of a report of Messrs. Payen and Pommier, who had been appointed to examine, on behalf of the Imperial and Central Agricultural Society of France, the works of Messrs. de Molon and Thurneysen, at Concarneau, established for the manufacture of fish manure on the same principle as that formed by them, three years before, at Newfoundland. The importance of this manufacture it is not easy to estimate, when it is considered that the raw material, as well as the labour, are native and inexhaustible; and that, consequently, the capital now employed in purchasing and conveying guano from the coast of Peru, &c., will be saved to the country, besides affording a vast amount of employment to fishermen and other industrious classes,

and a profitable employment of capital. Our next enquiry, therefore, is in regard to the quality of the manure thus produced—what analogy it bears to guano—and in what proportion it contains those ingredients which impart to guano its intrinsic value.

The fish manure, then, is made indifferently of fish, or the refuse of fish. By a process which is described in your paper, these raw materials are boiled, pressed, dried, and reduced to powder, and are then fit for use. These processes are mechanical, and exceedingly simple, and with proper apparatus occupy but a few hours. The establishment at Concarneau can manufacture from four to five tons per day, in a perfectly dry state, working only twelve hours in the day. The perfect desiccation of the manure secures the purchaser from the possibility of loss from damp; whilst there is no fear of adulteration, unless it gets into the hands of fraudulent dealers, who will soon become known.

The analogy between the fish manure and guano lies in their being both the products wholly of fish. The guano-bird lives solely on fish, and its excrement must therefore be those parts destitute of nutriment, and deprived of their oleaginous substances. Now, in the process of boiling, the decomposition of the fish takes place, and the oil, water, and other portions, which would be converted into aliment by the guano (the Peruvian name of the sea bird), are rendered capable of being drawn off, which in fact they are, by pressure; leaving just those portions which are voided by the bird. There is therefore, so far, no essential difference between the two substances; as is amply confirmed by analysis, the results of which constitute our last inquiry.

It appears by the report of M. de Molon and Thurneysen that the proportions of azote and phosphates in the two substances are as follows:—

	Azote.	Phosphates.
Fish manure, per cent.	12	22
Guano ditto	10	14
In favour of fish manure..	2	8

The value of these substances in manure, and the importance of obtaining them in the largest possible quantities, it is unnecessary for me to point out. They constitute the very essence of all manures for cereal crops more especially; and their direct application to the plant in so condensed a form as in guano or fish manure, is the cause of those extraordinary results we hear of in the produce; and in saving the farmer so much labour, both of men and horses, in the cartage of manure, they reduce the expense, as well as increase the return of the crop.

Experience, so far as it has gone, confirms the value of the fish manure as a substitute for guano. The farmers in France use it extensively, and the projectors find no difficulty in selling all they manufacture at the price of guano—about £9 per ton. It is probable that they will extend the manufacture to other towns both in France and in England, *unless the ground here should be previously occupied by Englishmen fixing their own establishments*, which I should be exceedingly glad to see. We are not generally behind-hand in enterprises of this nature; but certainly, with an abundance of the raw material all around our coast, we have allowed our neighbours to get the start of us in this case; and, if we do not take care, they will supersede us upon our own soil, as they have already done at Newfoundland.

I learn, however, that there is an establishment of the kind in the neighbourhood of the metropolis; but I am not acquainted with the parties, nor do I know the site, or anything respecting it, beyond its mere existence, which I heard of for the first time to-day. If I can get access to the party, I will obtain some of the manure, and let you hear something further respecting it.

Yours respectfully,

London, 1st June, 1855. S. C.

Note.—This letter was written before Professor Way had announced his intention of delivering a lecture on the 27th of June, since postponed to the 18th of the following month. I am glad to find that this subject has at length attracted the attention of our scientific men, and anticipate a great amount of benefit from the learned Professor's lecture, in both inducing capitalists to embark in the manufacture, and directing them to the most efficacious mode of conducting it.

THE BABRAHAM SHEEP-LETTING.

Few of our agricultural readers are unacquainted with the merits of the Babraham flock, and the annual gathering on the farm and under the hospitable roof of Mr. Jonas Webb. The anniversary this year was celebrated on Friday, July 20, and the whole of the proceedings went off with the usual *eclât*. It would be as gilding refined gold were we to attempt to expatiate on the merits of the animals exhibited, as their fame has spread over every sea, and into every clime in which cultivation has followed civilization; and the name of Mr. Jonas Webb will be revered as a benefactor to his kind by generations yet unborn when they hear of his indefatigable exertions and success in rendering perfect a breed of animals which are so important a necessary to the aliment of man. The Babraham gathering, too, is important in another point of view; for here are to be found the leading agriculturists from all parts of the world, and who, that is, such of them as are foreigners, have the opportunity of witnessing the English agricultural character in one of its most favourable lights. Mr. Webb, too, has lately turned his attention to the improvement of the breed of short-horns, and his herd on Friday was also a great attraction, many of its members passing into the possession of their admirers. In the field there were at least 600 persons, and the letting commenced about two o'clock; Mr. King, of the firm of Nockolds and King, of Saffron Walden, officiating with the hammer. Among the company were Viscount Falmouth; Eliot Yorke, Esq., M.P.; C. A. Smith, Esq., M.P.; Hon. and Rev. Henry Yorke, Hon. and Rev. Vernon Harcourt, Revds. S. Fendall and G. Greene; with Farquharson (Dorsetshire), E. Hicks, S. Jonas, Bradshaw, W. P. Hamond, B. Wortham, C. Wilkinson, C. Barnett, C. Crawley, Esqs., also Sir Robert Baker, and M. Robiou de la Tréhonnais, the latter of the French "Journal d'Agri-

culture Pratique." There were present also the agents of H.R.H. Prince Albert (Mr. Wilson), the Dukes of Manchester and Richmond, the Earl of Yarborough, Mr. Kekewitch (Wilts), and F. Pym, Esq., of the Hasells, Beds.

There were 207 tups penned, and the second led into the ring excited a most spirited competition, the last biddings being between the agent of the Duke of Richmond and Mr. Overman, a tenant-farmer of Weasenham, Norfolk; the first-mentioned was successful, and the sheep was knocked down to him for the unprecedented price of 170 guineas. Mr. Overman, however, secured the second highest priced tup for 130 guineas, and between the two animals there was but little difference in the points to be detected by the eye of a non-agriculturist. The weights of the clips of wool of each sheep were posted in the field, and from this we learned that the last fleece of the Duke's sheep weighed 8lb. 8oz.; one sheep, a three-year-old, yielded 10lb. 12oz. to the shears. 77 sheep fell under the hammer, the average price being £25 15s. 2d., and the total produce of the letting £1,983. 9s. The average price of the previous four years was as under :

Year.	No. let.	Average price.
		£ s. d.
1851	62	22 2 6
1852	69	22 3 0
1853	71	22 6 3
1854	75	25 4 3

In 1853 a sheep fetched 130 gs., and the top price in 1854 was 102 gs.

At the conclusion of the letting, rather more than 300 gentlemen partook of a most exquisite collation, prepared as usual in a tent adjoining Mr. Webb's house, and which had been most tastily and exquisitely decorated with evergreens and flowers, under the superintendence of Mrs. Webb and her amiable daughters, who throughout the day administered Mr. Webb's hospitality in the most liberal and graceful manner. The Hon. Eliot Yorke, M.P., presided, and was supported by Lord Arthur Hervey, Sir R. Baker, Hon. and Rev. H. Yorke, Major Lucas, Colonel Wall, with S. Quintin, R. Smith, E. Hicks, — Bradshaw, W. P. Hamond, C. Barnett, C. Crawley, F. Pym, and — Fordham, Esqs. The remainder of the company comprised the leading agriculturists from all parts of the country.

TENANT-RIGHT.

SIR,—I am glad to find, by your paper of last week, that you do not let this important subject sleep: that it requires rousing, I think the following particulars will prove :—

I wrote the other day for the conditions of letting of a large farm in the West of England. The rent asked is upwards of £700 per annum, exclusive of all rates, tithe rent-charge, &c., &c. The landlord reserves to himself all timber and timber-like trees; all quarries, mines, and minerals; *all game;* with power to enter at all times to cut down and remove timber (which may be greatly to the injury of the tenant's standing crops), "to dig and take the minerals and stone" (which is open to the same objection, and which destroys even the very surface which the tenant has hired), and to sport by himself, his servants, and friends, "doing as little damage as may be," but rendering no compensation for any done. The tenant is to keep buildings in repair (except roofs and outside walls), to find straw and labour for thatching, and to do all hauling for repairs to be done by landlord gratis; so that these may fall ten times more heavily upon the tenant than upon the landlord, and at a time of year when the tenant wants his own horses to work his land. The tenant is to prevent any person from sporting where he himself is not to sport, though he is to pay in rent alone upwards of £700 per annum, and for acting as an under-keeper is to receive no wages. He is to prevent all persons enclosing the waste opposite the mansion, an office which properly belongs to the landlord's steward. He is to consume all the hay, straw, &c., upon the premises, and all roots, &c., grown on the farm; and to leave the landlord all the dung made the last year, "without recompence"; and though the house is within a few miles of a railway, and there may be excellent opportunities of selling in large towns the hay, straw, &c., and of bringing back in their place bone-dust, and which may be better than dung, and far less laborious to carry and spread, yet neither hay, straw, nor roots may be sold off the premises, but must be made into dung, and laid thereon.

I have said that the rent is to be upwards of £700 per annum; that the tenant is not to sport, but to preserve his landlord's game; and yet, without any amusement left him on his own farm, and paying a rent exceeding the qualification of a county M.P., he is to *reside in the mansion,* and not to let any part of it—a sad prospect in case of ill-health! He is to stock the land well with cattle, and to pen all his sheep, except fatting sheep; but "he *is not to take in horses or cattle to keep*" (though this would not be so humiliating as being his landlord's under-keeper, and is done by noblemen and M.P.'s in their parks, &c.), and he is not to *tread the meadows with horses and cattle in wet seasons;* so that, as he cannot in such seasons make hay upon them, and must fold his sheep on his clovers, he is unable in wet seasons to make any rent from his meadows, though he has, of course, to pay rent for them. He is not to mow any of the meadows two succeeding years, "nor to grow hemp, teazels, or other exhausting crop," but he is to lay down one-fourth at least of the arable in grass—proofs that the farm is not likely to be run out, and that the landlord has taken good care of himself.

Some of the restrictions imposed upon the tenant, and the course of husbandry dictated to him, to say nothing of the restriction as to residence and the taking in of stock, are painful and humiliating. They are not suited to the spirit of the times, nor to the position which a tenant paying upwards of £700 per annum rent should hold; and I, for one, am surprised that any landlord should think of introducing them. I own I think that, if a tenant crops the land to the greatest possible extent, without impoverishing it, no landlord has a right to be dissatisfied with his farming; while he does the State much service by rendering it most productive. Landlords have strung the bow already far too tight. It is quite time that they should loosen it; for tenants will not be so plentiful as they were when labourers were to be had and to spare, and now it is very difficult to get any, or to keep them, and rents will soon be affected by it.

I am, sir, your obedient servant,

July 19, 1855. S. T.

DRAINING.

"Any great improvement in this, the most important of all arts the true theory of the nutritive process in vegetables, is inconceivable without a deeper and more perfect acquaintance with the substances which nourish them, and with the sources whence they are derived."—LIEBIG.

And from the above authority there is no appeal; therefore let us now inquire what are those substances of nutrition, whence derived, and how most judiciously applied.

The atmosphere contains the principal food of plants, in the form of carbonic acid, hydrogen, and nitrogen; that is, the plant has the power of decomposing rain water, appropriating to itself the hydrogen of the water, and setting the oxygen free. But all discoveries in physics must remain without fruit, and useless, because to the many, carbonic acid, ammonia, acids, and bases, are sounds without meaning; which awaken no thoughts, create no associations. They treat those sciences as the vulgar do a foreign language and literature; *i. e.*, in the exact proportion to their ignorance of it. But to those who will listen, Nature speaks in a peculiar language, and answers at all times all such questions as are properly put to her; and such questions are experiments. If you engraft a rose twig on a lemon tree, it will not produce lemons, but roses. If you sow the cereals in boggy earth, they will not yield increase. If you make your residence near stagnant pools, carburetted hydrogen will taint the air, and your life is ended. Will-o'-th'-wisp may live there, but you cannot. Let but the scientific drainer stick his spade into this sterile pestilent morass, and as by the magicians' wand the face of the country is changed, fertility has succeeded barrenness, and health and salubrity have for ever banished miasma, disease, and death. How, then, can we sit at home at ease, without even asking ourselves Can these things be? although listlessly knowing that science is never unwilling to lend her aid to the practical arts; on the contrary, she is ever forward to proffer her assistance when honestly desired. A generation of a thousand million men is renewed every thirty years; thousands of millions of other animals cease to live, and are reproduced in a much shorter period. What, then, has become of the nitrogen they contained during life? All dead animals, no matter in what condition, during their decay yield all the nitrogen they contained during life to the atmosphere, in the form of ammonia. And ammonia is the simplest of all the compounds of nitrogen, and hydrogen is the element for which nitrogen possesses the greatest affinity. The A B C, then, of which is (water being composed of hydrogen and oxygen) that rain-water fresh from the clouds, especially the few first showers, must necessarily be surcharged with ammonia, the very element that a growing vegetable is panting for. From this we gather that it is FRESH *rain water* the plant is thirsting for; because stagnant water, or such as has remained long in the earth, has lost its ammonia, and consequently its fertilising virtues, and has actually become noxious rather than renovating. And we know that undrained or shallow-drained land is always wet beneath those deceptive shallow drains, which pernicious water is by capillary attraction ever rising to the roots of plants, to their great detriment, and also by evaporation to the surface, greatly depressing the temperature of the soil below that of the superincumbent air. For it is universally true that whenever water is evaporated the ascending vapour carries off much heat along with it, and also creating disease to man and beast. How those beneficent gases are to be conveyed to the roots of plants shall form the subject of a future letter.

Adderbury, Oxon,
May 30, 1855.

I am, sir, yours, &c.,
EDWIN C. WILSON.

SHORTHORNED CATTLE *versus* LONGHORN, HEREFORD, DEVON, SUSSEX, AND SCOT.

SIR,—If memory serves me right, in the year 1816 I saw tried or fed together, for two years, a three-years-old shorthorn Durham, valued at 20*l.*; a three-years-old Rollwright or Bakewell longhorned steer, valued at 15*l.*; and a three-years-old dun Highland Scot, value 12*l.*—all equally good of their kind. The first winter, they lay out in the open air—no hovel or cover for them to go under—in a close three miles from Boston and about one mile from the sea, and wintered upon nothing but hay. The following summer they were grazed upon first-rate land together; and the second winter, they lay again in the open air, in the same field as they were before wintered in, with 7lb. of cake per day each, with some strong, coarse hay; and they were grazed in the same close as the summer before, without cake, until the last week in September, when they were sent into Northamptonshire, and fed under cover, and had 14lb. of cake per day each, until they came to the great Christmas market in Smithfield, when they were sold, the shorthorned ox making 82*l.*, to Mr. Somers, of Somers Town, weight 151 st. 6lb. of 14lb. to the stone. The longhorned ox sold for 52*l.* 10s. to Mr. Warmington; weight, 99 st. 11lb. The Scot was sold at 45*l.* to Mr. Parden; weight, 86 st. of 14lb. The three above oxen were exhibited the last year at Boston Fair, on the 4th of May, and at Peterborough Fair on the 2nd of October, with seven Lincolnshire oxen of the old Turnil breed, for which the owner was bid 60*l.* each, or 420*l.* for the seven Lincolns, before they had eaten linseed cake. I saw weighed, in the spring of the following year, a gigantic worked Lincolnshire shorthorned ox, a giant Sussex worked ox, a handsome Hereford worked ox, a very large oldfashioned longhorned ox (not worked), a very fine-boned smart North Devon worked ox, and a great polled Scot (not worked). They were all good of their kind, and in a lean state when weighed, and were all grazed in one field of first-rate land, near Boston, for 24 weeks, when the shorthorn Lincoln ox gained 36 st. of 14lb., which was 15 per cent., the most weight; the giant Sussex ox next; the longhorned ox third; the handsome Hereford fourth; the great polled Scot fifth; and the North Devon, being so much less in frame and bone, gained the least weight in 24 weeks' grazing. I am satisfied that the North Devon consumed much the least food.

It is to be found in many of the files of journals that Mr. Coke, the late Earl of Leicester, tried an experiment with a gigantic shorthorned ox of the old Teeswater kind, against two fine-boned handsome North Devon oxen of the same age. They were fed in the stalls for a long time, and the food weighed to them, until the shorthorned ox had gained 110 stone in weight, and the two Devons together 140 stone; but upon investigation, it is said, Mr. Coke found that the giant shorthorned ox had consumed a little more food than both the North Devons. "Gigantic animals," said Mr. C., "have gigantic entrails, and it takes a gigantic quantity of food to fill them." The trial proving in favour of the Devons, is said to be the cause of Mr. Coke breeding North Devon cattle.

I knew a Lincolnshire-bred ox, with a dip of the Durham in him, in 1815, that gained 50 stone of 14lb. in 46 weeks, fed upon grass and plenty of Swede turnips only, for more than half the year. The weight of this ox was 140 stone 8lb., of 14lb. to the stone; slaughtered by Mr. Somers, of Somers Town.

It was proved by Mr. Bakewell and many other clever men that great, coarse, large-boned animals consumed much more food than fine-boned, high-bred animals, which have a greater propensity to fatten. It may easily be proved whether Mr. Coke's bailiff's evidence or statement was correct in the three oxen's weight of carcass and food, because any breeder may try the experiment with a shorthorn and a North Devon. It is worth trying.

SAMUEL ARNSBY.

86, *Vauxhall-street, Vauxhall, Surrey, June* 8.

LARGE AND SMALL OCCUPATION REAPING MACHINES.

SIR,—At intervals since the introduction of the American reaping machine in the "Great Exhibition" year, letters have appeared in your paper upon the reaping machine question; but I do not recollect having yet seen the questions answered—What kind of machine is best adapted for large occupations? and what kind is best and most applicable for small occupations?

Having acquainted myself with the working of every reaping machine (worthy of the name) which has been exhibited in England and Scotland since 1851, and as there have been a greater number and variety of machines (regularly at work during the last four harvests) in the same area, in the part of the country in which I reside, than in any other district of England, I trust you will not think me presuming by the attempt to answer the questions referred to; though I should not have made the attempt, had I not observed, of late, letters in your paper upon the late and coming trials of the "*Steam Cultivator*" ploughs, &c., showing what particular powers and capabilities agriculturists require such implements should possess, what *kind* of trials are best to test the real qualities of such implements, &c.

In every class of improved implements there are a *variety* of sizes and kinds needed, to meet the variations in soils, modes of cultivation, &c.: for example, our most eminent implement makers exhibit "light and heavy land ploughs and harrows;" "small and large occupation drills;" grubbers for the North (where there is "no time for Autumn cleaning"); cultivators for the South, to scarify in the Autumn and "grub" in the Spring.

This idea of a *universal* implement is looked upon by the leading agriculturists in the same way that every man of common sense views a medicine professing to cure *every* disease "that flesh is heir to."

The idea of a *universal reaping* machine is equally opposed to the experience of agriculturists who have had the greatest experience in the practical every-day working of every kind of reapers extant.

By small occupations I assume that they are generally strong-land farms (this is the case North of the Humber), upon which few turnips can be grown *to profit;* hence the bulk of the corn grown is wheat. The fields are small, and the surface uneven; for though drained, the old high-backed ridges have not altogether disappeared.

As a general rule, the large holdings are light soils—turnip and barley land farms; the fields large, and the surface flat and regular. Where large strong-land farms occur, they are generally in a higher state of cultivation, from the facts of more capital being invested, greater facilities, and other well-known causes.

For the kind of small occupations I have described, the machines should be simple in construction, compact, light in draught for a pair of horses walking at a ploughing pace, adapted if possible both for end and side delivery (the latter to lay the corn clear of the horses' track); the labour of the man in raking the corn into sheaves from the machine should be easier than mowing and other heavy field work, and to require no more skill than is possessed by an ordinary farm labourer.

If the *price of such a machine is moderate*, if the stubble is cut lower and more regular than by the sickle, the sheaves laid more evenly than by the scythe, and the corn less scattered, then the days of both sickle and scythe will be soon at an end, as tools of *general* use on the farm.

The large occupiers having a superior class of soil, and in a high state of cultivation, machinery of a more complex and scientific character can be advantageously applied; in a word, a *self-acting side-delivery machine* is wanted, to deliver the corn in a continuous swathe (or sheaves of a *uniform* size, if attainable).

The machine should be easily managed by *one* man, and within the power of a pair of horses, walking at their regular pace; the machinery so constructed, that the regular village blacksmiths and cartwrights could repair any derangement.

If the work performed by such a machine is done at *less cost* than with the scythe, less corn scattered, the swathe more regular and even, added to the fact that the farmer can cut his corn at the *proper state of ripeness* (*having the means at command*), then the time is not distant when the reaping-machine will be considered as indispensable as the plough.

In conclusion, though I firmly believe that the reaping-machine will as completely supersede the scythe and the sickle, (under the circumstances named) as the thrashing-machine has superseded the flail, I am not so sanguine as to believe that a man occupying a poor *undrained, cold clay farm, with high-backed ridges, deep open furrows, and water "grips,"* can use a machine to advantage (if he *by chance* happens to afford to buy one) until he takes the water off, *under* the surface instead of *over* it. Nor do I believe that a farmer consults his interest by attempting to cut corn lying *flat* on the surface (heavy and *leaning* crops can be cut).

Too much was expected of the machines at first, hence the *temporary* reaction.

If the agriculturists of Great Britain can be supplied with machines realizing all I have attempted to describe they are required to do, then I think the general opinion will be that, in modern times no implement has been introduced which will have conferred a greater boon upon the agriculturists of England and Scotland.

That the forthcoming agricultural shows may produce reaping and other machines beyond all that could be desired, is the wish of

A FARMER'S SON.

North of the Humber.

THE CATTLE PLAGUE.

"In consequence of the near approach of the so-called Rinderpest, or cattle plague, which has been for a long time past committing fearful ravages amongst the flocks and herds in Russia, the authorities in Memel have taken the alarm, and considered it necessary to take some energetic steps to prevent the introduction of the dreadful pestilence into Prussia. They have, therefore, just published a proclamation totally prohibiting the importation from Russia of horned cattle, sheep, goats, pigs, dogs, and poultry; fresh skins of oxen and other animals, horns, unmelted tallow, fresh beef, furs, manure, and stable implements that have been used. The following articles are prohibited if there is reason to believe they are the produce of infected or suspected districts:—Raw wool, dried hides, and the hair of animals, with the exception of hogs' bristles. All persons who from the nature of their avocations may be fairly supposed to have had personal contact with infected cattle, such as cattle-dealers, butchers, graziers, drovers, tanners, leather merchants, and poultry dealers, will not be allowed to enter the Prussian territory, and should special reasons exist for making exceptions in particular cases, they must remain for some days before their admission under the surveillance of the authorities, submitting to such regulations as may be considered needful for the general security. In order the more effectually to maintain a control over travellers and goods arriving from Russia, they will only be allowed to cross the frontiers at the stations of Nimmersatt, Bajohren, Langallen, and Paschenkrug, all the others being for the present hermetically closed, except to goods and passengers going across the frontiers into Russia."

The above appeared in the columns of *The Press* newspaper a fortnight since. Amongst others whose attention it attracted was that of Lord Berners, who immediately felt it his duty to ascertain how far so startling and alarming an announcement might really be correct. The report of the proceedings at the meeting of the Royal Agricultural Society on June 27, will show that it is but too true. An official inquiry on the part of the Government materially confirms what our contemporary had already supplied. This is very properly promulgated through the agency of the Agricultural Society, the members of which owe an especial vote of thanks to Lord Berners for the care he has evinced on their behalf.

It would be almost impossible to give too much of our serious consideration to this matter. In the outset, however, it is satisfactory to know that the attention of the Government has been directly called to it. The next most important question is, how far the agriculturist or veterinarian may be able to assist in, or suggest any measures of prevention which shall be determined on for the safety of this country. There will be many of our readers who have already suffered from the introduction of some such catagious disease into their herds and flocks. Their experience, though dearly bought, may be now turned to some account. Only let them imitate the example Lord Berners has so well offered them, and *at once* bestir themselves to do what they can. If ever an old proverb had its value it may be applied here. "Prevention is not only better than a cure," but it may be everything. The channels of communication through the press, by means of the Royal Agricultural Society, or to the Government, are easy and ample enough. *Bis dat qui dat cito*, and we think well enough of our rulers to believe they will do all that is necessary if we will only demonstrate to them what this is.

Like many of the diseases which affect the human frame, it is very probable that these cattle plagues may become periodical in their appearance. It is certain that the advent of this, or something similar to it, has been for a considerable time expected by those best qualified to judge. In the excellent report from the Royal Veterinary College, addressed to the Royal Agricultural Society in the early part of last February, this is one of the points especially dwelt on. We had occasion to remark on it when first published, though it will not be out of place here to repeat the substance of what was embodied in this communication. In the proceedings of the Society it runs thus:—

"The Council having received at their last December meeting a communication from the French Government, requesting the aid of the Society in investigating the nature of a disease which had made its appearance in Turkey among the cattle intended for the Crimea, the Council at once instructed Prof. Simonds, as the Veterinary-Inspector of the Society, to place himself in immediate communication with M. Herbet, the Consul-General of France in London, and to furnish him with every information he possessed that might aid the French Government in their inquiry. The Report of the Governors of the Veterinary College contains the following reference to that circumstance:—

'6. CONTAGIOUS TYPHUS.—As a preliminary step, and

with the sanction of the Consul-General, Prof. Simonds has prepared a list of questions to be forwarded to the several veterinary surgeons now with their regiments in the Crimea. These questions are annexed to this report, and the Governors trust that the Society will agree with them in the opinion that on answers being obtained, such an amount of information will be possessed on this subject as cannot fail, when acted upon, to be of essential service in effecting the desired object. It is likewise to be remembered that the history of these epizootic affections shows that when once they have taken root in any of the countries of Europe, they have spread with greater or less rapidity over the whole Continent, destroying the cattle by thousands in their course. It is this circumstance, added to the fact of the existence of the disease in Turkey, which has created so much solicitude on the part of the French Government, and the Governors cannot but feel equally anxious in the matter, seeing that if the cattle in France or Germany should become affected, our own would ere long fall victims to the direful pest, from the free importations of animals which now exist.' "

We felt, as we said when this report first appeared, "that it would have been interesting, if not more decidedly useful, to have seen Professor Simonds' table of questions." We think so still. No doubt these will appear in the forthcoming number of the *Journal*. In the interim, however, have we learned, or can we do nothing more? This, be it remembered, is just one of those matters in which the Royal Agricultural Society should take the initiative. It should be the object of such a body to advise the Government and the country how to act. Is it too late in the season for bringing the valuable services of Professor Simonds again to our aid? We should almost hope not; but that he might yet be induced to deliver a lecture on the best means of meeting or guarding against this evil, at one of the weekly meetings still due before the Carlisle Show. Have there been no answers or information received from the gentlemen of his own profession now out with our troops, and so near to the scene of this plague? We should be induced to believe that the Professor must have material for a lecture that would just at present be particularly acceptable to the agriculturists of this country. This would no doubt work up into a very good paper for the *Journal;* but we cannot help thinking that its use would be doubled if at once delivered *viva voce* before the members of the Society, and circulated as *immediately* by the agency of the agricultural press. It is just one of those cases in which delay is of all things to be dreaded. *Bis dat qui dat cito.*

THICK AND THIN SOWING.

Whenever new theories are started, the public mind becomes attracted by them just in proportion as they appear improbable or unattainable; and the most absurd, therefore, frequently obtain the greatest notoriety. Within the last twenty-five years Lord Western, who was really an experienced cultivator, endeavoured to establish as a principle that thick sowing was most advantageous. Public inspection was invited, and large assemblages of practical agriculturists attended his meetings—to agree with him that sixteen pecks of wheat drilled per acre was not too little. Mr. Mechi, within ten years afterwards, was endeavouring to prove that four pecks was too much; and Mr. Wilkin was so desirous to appear as a determined disciple of the new school, that he proposed to quarrel with his friend (Mr. Mechi) because he altered his opinion for a larger quantity, and challenged his own crops —grown from a far less quantity of seed than that last mentioned—and thereby endeavoured to prove that even half that quantity was sufficient. And we have seen some experiments lately recorded as having been made at Maldon, in Essex, by a nurseryman of the name of Hardy, from single grains at spaces of several inches, the produce of which, as represented, is much larger than on ordinary occasions can be produced.

We have ourselves inspected portions grown in this manner, and found them exceedingly vigorous at this season, but generally a falling off becomes apparent as harvest approached. Last season it was especially the case: within ten days of harvest the blight overspread the whole, and the produce became not only diminished, but the sample also deteriorated to an extent of at least 50 per cent.; and this is not a solitary instance. We maintain that it must ever be liable to contingencies of a like nature whenever the plant is so thin that vigorous growth of individual plants is made to compensate for a plant regularly and evenly distributed throughout.

Indeed, had any doubt existed previously upon its merits, the late severe winter has tested the practice to such an extent as to leave no doubt whatever upon the minds of practical agriculturists that it is better to allow for the contingencies of seasons and the destruction by vermin, than to risk the result upon sowing barely sufficient grains, even if success should occasionally so far attend the experiment as to ensure a full crop.

It is true that a few pints of wheat might, by careful planting, be sufficient for an acre. By calculation it may be shown that, by an equal distribution of them, a plant might be obtained

with 1,089 grains upon each square perch, at six inches apart, and, consequently, that 174,240 grains would be sufficient for one acre; yet, in practice we find that, with six times that number, great deficiency of plant sometimes exists, and, notwithstanding the promising and vigorous appearance of the wheat crop even at present, in many districts the deficiency is so great as to cause some apprehension as regards the result.

From time to time persons have advanced the theory of thin sowing; and yet with all that has been said and written upon the subject, farmers are still disposed to keep upon the safe side, and to advocate the practice of sowing more than *enough*. Even Mr. Mechi has been disposed to admit his first opinions as erroneous, having acknowledged that about six pecks per statute acre is the proper quantity for general purposes upon well-cultivated soils, and with this opinion most other cultivators agree.

In a work intitled "A Collection of Improvements in Husbandry and Trade," as communicated by several members of the Royal Society to the collector, John Houghton, F.R.S., it is stated that deep ploughing may be as good as digging; and a Mr. Platt is quoted as having by that system produced 15 qrs. from an acre. In another communication the writer mentions that, by thin setting, 30 qrs. an acre being grown from grains planted at 3 inches distance! and he concludes thus—"If I were worthy to advise, I would have the country farmers send their sons they design to breed in their own way to live a year or two with the husbandmen about London, that are partly gardeners and partly ploughmen." As the date of this communication is March 30, 1694, it shows clearly that the attention of thinking individuals had, at least, been directed to the subject, however exaggerated the quantity may appear.

By comparing dates we find from the above experiments—at any rate, as so recorded—that we have advanced but little. Solomon has said, there is nothing new under the sun; and indeed these *facts* appear to confute the experimentalists of the present day, and will probably be as currently believed now as was then the case! Sufficient, however, may be gathered from them to show that the subject occupied public attention to an extent equal to that of the present moment.

If apprehensions of the ill-success of thinly-planted wheat then existed, and which appears was the case, it still exists to an equal extent. The land half occupied produces extraordinary luxuriance of foliage, which, if all things combine to a successful issue, might produce a superabundant crop; but on the other hand, under the effect of blight or mildew, that appearance of health would become the source of disease, which might altogether destroy the produce.

To ensure success, the plant should be full, and the stems should be so thick as to give and receive support from each other. Upon highly-cultivated soils this is especially necessary; as also to prevent over-luxuriance, as exhibited by depth of colour. In fact, whatever may have been said and written upon the subject, farmers are much of the same opinion now that existed nearly 200 years ago, that is, they still adhere to the practice of sowing sufficient to meet contingencies, and to ensure a full plant to the end.

GUANO: ITS HISTORY.—Guano, as most people understand, is imported from the islands of the Pacific—mostly of the Chincha group off the coast of Peru, and under the dominion of that government. Its sale is made a monopoly, and the avails, to a great extent, go to pay the British holders of Peruvian government bonds, giving them, to all intents and purposes, a lien upon the profits of a treasure intrinsically more valuable than the gold mines of California. There are deposits of this unsurpassed fertilizer in some places to the depth of sixty or seventy feet, and over large extents of surface. These guano fields are generally conceded to be the excrements of aquatic fowls which live and nestle in great numbers around the islands. They seem designed by nature to rescue, at least in part, that untold amount of fertilizing material which every river and brooklet is rolling into the sea. The wash of alluvial soils, the floating refuse of the field and forest, and, above all, the wasted materials of great cities, are constantly being carried by the tidal currents out to sea. These, to a certain extent at least, go to nourish, directly or indirectly, submarine vegetable and animal life, which in turn goes to feed the birds whose excrements at our day are brought away by the ship-load from the Chincha islands. The bird is a beautifully-arranged chemical laboratory, fitted up to perform a single operation, viz.—to take the fish as food, burn out the carbon by means of its respiratory functions, and deposit the remainder in the shape of an incomparable fertilizer. But how many ages have these depositions of seventy feet in thickness been accumulating? There are at the present day countless numbers of the birds resting upon the islands at night; but, according to Baron Humboldt, the excrements of the birds for the space of three centuries would not form a stratum over one-third of an inch in thickness. By an easy mathematical calculation, it will be seen that at this rate of deposition, it would take seven thousand five hundred and sixty centuries, or seven hundred and fifty-six thousand years, to form the deepest guano bed! Such a calculation carries us back well on towards a former geological period, and proves one, and perhaps both, of two things—first, that in past ages an infinitely greater number of these birds hovered over the islands; and secondly, that the material world existed at a period long anterior to its fitness as the abode of man. The length of man's existence is infinitesimal, compared with such a cycle of years; and the facts recorded on every leaf of the material universe ought, if it does not, to teach us humility. That a little bird, whose individual existence is as nothing, should, in its united action, produce the means of bringing back to an active fertility whole provinces of waste and barren lands, is one of a thousand facts to show how apparently insignificant agencies in the economy of nature produce momentous results.

GUANO AND SUPERPHOSPHATE AS SPECIFIC MANURES FOR WHEAT AND TURNIPS.

At the last monthly meeting of the Reading Farmers' Club the above subject was introduced for discussion by Mr. HIBBERD who said—It is highly necessary that, if we lay out our money in guanos and superphosphates, we should be thoroughly acquainted as to the practice of judiciously applying them; by this I mean, not only that we should understand the exact time or mode of application, but know well the particular crops they are specially calculated to benefit as "specific manures." Farm-yard manure contains all the ingredients requisite for the different crops we cultivate, but unfortunately we cannot, or do not, obtain it in sufficient quantities, and therefore we have recourse to guano and superphosphate to make up the deficiency. But how, in many cases, are these expensive adjuncts used on the farm? I have known men, when their dung has run short for wheat, apply superphosphate as a substitute; and I have known others use Peruvian guano for turnips, when phosphates with but little ammonia would have produced them better crops. In such cases there is money lost both to the producer and the consumer, because the axiom of growing the greatest possible amount of food at the lowest possible expense is totally reversed. If you saw a man feeding his pigs on hay and his bullocks on wash, you would say he was acting absurdly; but, in my opinion, not more so than he who gives his corn crops phosphorus and his root crops nitrogen. After nearly eighteen years' experience, I have found one thing is pretty certain, and that is, wheat requires nitrogen. You might as well ask your shoemaker to make a pair of shoes from a yard of calico, or any other absurd thing, as to ask of dame Nature to give you a crop of wheat, while you supply her with materials suitable only for a crop of straw. I have seen farms produce heavy crops of straw and light crops of wheat, when, if there had been less carbon and more nitrogen in the soil, the result would have been very different. Nature explains to us most emphatically, that "what a man sows that shall he also reap." Wheat contains gluten, and this gluten is produced by nitrogen, and therefore nitrogen in sufficient quantity must be present in the soil, or we shall fail to reap a full crop of corn, however good and heavy our crop of straw might be. When I make a statement, I like to give a reason for doing so. Look for a moment at the analysis of wheat—the flour of wheat. In 100lbs. of flour, there are 50lbs. starch and 10lbs. gluten. I need not mention the other ingredients, as they are unimportant to this enquiry. The starch is composed of carbon and water (36lbs. carbon and 45lbs. water, making 81lbs. of starch), and this can be obtained by the decomposition of vegetable matter, found in farm-yard manure generally in sufficient quantities. The gluten (the part most difficult to supply) is composed of nitrogen, *i. e.*, nitrogen is essential to its production in the flour of wheat; and if nitrogen be wanting in the soil, there can, of course, be no gluten formed, and consequently no wheat. In farm-yard manure, however, there is nitrogen, though, in most cases, so deficient in quantity that the production of a full crop of corn may not be reasonably expected; and this is the time when the farmer requires assistance in the shape of some specific manure which will give him a full supply of this fertilizing gas. Now, if I have satisfied you that the specific for wheat is nitrogen, then the question arises, how is it to be obtained at the cheapest rate? Let us refer for a moment to the prices of some fertilizers usually recommended to supply nitrogen. Carbonate of ammonia supplies, at its present commercial value, ammonia at 1s. 6d. per lb. (It should be observed here, that nitrogen is taken up by plants in the shape of ammonia—14lbs. nitrogen and 3lbs. hydrogen, making 17lbs. of ammonia.) Sulphate of ammonia contains 14 per cent. of the gas in question, and at its present value (£18 per ton) yields ammonia at about 1s. 3d. per lb.; muriate of ammonia produces it at 8d. per lb.; soot, about the same price; and shoddy perhaps rather higher than 8d.; but in the best Peruvian guano, I find an article which yields ammonia at a little over 6d. per lb., *i. e.*, supposing it to cost £12 per ton, which is now, I think, about its market value. [Some reference was here made by the speaker to the analysis of Peruvian guano, as compared with that of the flesh and blood of animals, gluten, &c., tending to show that the amount of nitrogen contained in each was almost identical. He, Mr. H., then proceeded as follows]:—The reason that wheat almost invariably produces a fair crop after clover, beans, rape, &c., is owing to the fact that these vegetables are all collectors and depositors of ammonia, and therefore the natural precursors of wheat in the usual routine of farming. The heavier your crop of clover, the more nitrogen will be accumulated and laid up for your future crop of wheat; the practice therefore now prevalent of putting dung on the young clover, must be a good one. I will now give you the particulars of an experiment tried on a piece of land exhausted for the purpose, which, I think, will show that ammonia is a specific for wheat, and that superphosphate is of little use to it. The first portion, without manure, gave a produce of 16¾ bushels per acre; the second, with 700lbs. superphosphate, 16¾ bushels; third, with 14 loads dung, 22 bushels; fourth, with superphosphate as above, and a portion of sulphate of ammonia, 26¼ bushels. I think, as the 700lbs. superphosphate evidently did no good, the amount of produce being the same (16¾ bushels) as that on the unmanured land, and that, as in the fourth case, the produce at once rose by the application of ammonia, to 26¼ bushels, there can be no doubt that the presence of nitrogen in the soil is not only necessary, but that an ample supply must be found there, before you can reasonably expect a full crop of wheat. The experiment showed also that superphosphate did no good in that instance. As I at first stated, wheat requires nitrogen, and generally to a greater extent than farmers, from the size and quality of their manure heaps, can afford. I have also stated that Peruvian guano is rich in this gas, producing ammonia at a little over 6d. per lb., the lowest price at which it can be obtained in the market. I usually apply it as a top dressing, in the month of February; but in clay lands it should, I think, be drilled in at seed time. [The analysis of different samples of guano was here referred to, in order to show that farmers should be particular as to the quality of manure they purchased. Mr. Hibberd then proceeded with the second part of his subject, as follows]:—I have stated that Peruvian guano is a specific for wheat, and now I shall attempt to prove that superphosphate is the best manure for turnips. In doing this, I shall confine myself to the results of experiments only, made by myself and others. In the year 1851, I made an experiment in a field of five acres, which was exhausted of

its fertility, and therefore suitable for the purpose. The first portion was drilled without manure; second, with ashes only; third, with ashes and 4 cwt. ammoniated peat; fourth, with 3 cwt. ammoniated peat and 1 cwt. dissolved bones. Where no manure was used, the crop was very bad, not worth standing, in fact. The ashes produced a small crop, say about 5 tons per acre. The ammoniated peat, with ashes, was much better; but in that portion where the dissolved bones were used with ammoniated peat, the difference was remarkable indeed, producing at least 20 tons per acre. I regret that I did not have the different lots accurately weighed, as it would have proved very strongly the superiority of superphosphate as a specific manure for turnips. It should be remarked that experiments of this kind are not of much value unless made in exhausted soils, as land in a fair ordinary state of cultivation would with a favourable season produce tolerable crops perhaps without much assistance from specific fertilizers. The next is an experiment made by the Yorkshire Society, on an exhausted clay soil.

	Tons.	Cwt.
1st, natural produce	1	6
2nd, with 12 tons Dung	12	0
3rd, „ 2 cwt. guano	4	6
4th, „ 2 cwt. coprolites.....	11	8

Coprolites (natural phosphates) contain about 55 per cent. of bone earth. This experiment proves that, in a poor clay soil, superphosphate would produce for 10s. nearly three times the weight of turnips that would result from an application of guano costing 20s. As far, however, as my own experience goes, I would recommend that a portion—say one-third guano—should be used with dissolved bones for turnip culture on heavy soils, as it causes a more rapid action of the manure, which is desirable in cold lands. Another experiment showed that 10 loads of dung, with 2 cwt. superphosphate, produced a heavier crop than 30 loads without superphosphate; and in another instance, where a field was equally dunged all over, showed that 2 cwt. superphosphate (a part being manured with it for the purpose of testing its efficacy) gave an increase of 5 tons' weight in bulb, over the rest of the field where no specific manure was used. I could relate many similar cases, but I think enough has been said to prove that phosphorus is the specific for turnips. As many are in the habit of using guano for turnips, in preference to superphosphate, I would mention an experiment that was made, the result of which showed, that its addition to the dung caused the turnips to grow more rankly, but gave a less weight of bulb per acre, than dung alone—a result just contrary to the one above mentioned, where the addition of superphosphate gave an increase of 5 tons of turnips per acre. Superphosphate is admirably adapted to the growth of turnips in their first stages of vegetation. It is like milk to the young animal, pushing the plant forward at a time when its infant system could not possibly derive sustenance from rougher or less suitable food. Guano is too pungent, too strong for this delicate office, and not calculated to take the place of superphosphate, as food for the young turnip. The superphosphate I refer to, is that made entirely from bones dissolved in sulphuric acid, and the mode of producing it is very simple. I have made a great many tons for my own use, and for other parties; and the mode I have adopted is as follows: To 100lbs. fine bone dust put 30lbs. best white acid and 30lbs. water; in making it, place a portion of the bone dust in a tub or trough, then add water, then sulphuric acid. Do this alternately, until your vessel is full; the whole may then remain until cold, when it is fit for use. Some experiments, tending to show that turnips grown by superphosphate were superior in feeding qualities to those produced by guano, were then referred to; after which Mr. Hibberd said he should leave the subject in the hands of the members present.

Mr. T. W. Hicks, Mr. W. J. Hewett, Mr. Young, Mr. Parsons, and others, took part in the discussion, and ultimately the following resolutions were agreed to: "First—It is the opinion of this meeting that nitrogen is the specific manure required by wheat, and that Peruvian guano is the best and cheapest medium through which it can be obtained. Second—That phosphorus is the specific manure required by turnips, and that superphosphate is the proper medium through which to apply it."

RAIN IN SUMMER.

BY B. P. SHILLABER.

The farmer's heart was sad, his toil was vain,
His famished crops were crisping in the field,
For not one drop of life-sustaining rain
Did the red clouds of summer deign to yield.

The cattle neath the trees, with lolling tongue,
Gave up the search of herbage in despair,
And listless in the shade their heads they hung,
And chewed their cuds with most desponding air.

The brook was dry, or stood a muddy pool,
Whose stagnant waters none might dare to drink,
Which late, in crystal brightness, pure and cool,
Wooed with its song the thirsty to its brink.

The burning sun drank up the pearly dew
That evening, pitying, on creation shed,
And o'er the parched earth his hot beams threw—
The herbage sickened, and the flowers lay dead.

The river shimmered in its lurid rays,
The corn grew dry and withered as it stood,
The fainting birds scarce raised their tunely lays
In dim recesses of the ancient wood.

Then man and vegetation prayed for rain—
The withered stalks, like famished hands were raised;
But day by day was man's petition vain,
The clouds arose and vanished as he gazed.

At length the blessed boon, so long withheld,
Came like an angel down in man's dismay,
Cheering the heart that well-nigh had rebelled,
And giving joy where grief erewhile held sway.

The thirsty earth drank in with greedy tongue
The cooling flood that trickled o'er its breast;
The trees abroad their arms enraptured flung,
And grass and flower once more upreared their crest.

The brooks again resumed their gladsome song,
And through the meadows took their cheerful way;
Once more the corn its verdant pennons flung,
Once more the birds made merry on the spray.

The farmer's heart grew glad, and on his knee,
His voice attuned with warm devotion's strain,
He poured his soul in gratitude to see
The blessed coming of the summer rain,

Which falls like God's own spirit on the dust
Of man's fallen nature, dead in sin and pain,
Till with a newer hope and holier trust
It wakens into life and joy again.

THE STEAM CULTIVATOR.

Every one expects a steam-cultivator to perform the *deep* work at present taxing the strength of our horses, and testing the framework of our ploughs; and, from what we have advanced in previous articles, we infer that steam-power can offer no greater boon to the heavy-land farmer than a trenching or digging engine. If Mr. Usher succeed in ploughing and stirring loamy soils, and Mr. Williams manage to plough either light or strong land, there will still remain (in our opinion) a demand for some more perfect deep-working and inverting implement. Agriculturists on the clays ought not to rest until the means of developing the riches of their fields shall be supplied them; and, as we have said before, the spade may teach the nature of their requirements. The fundamental tillage operation is, *inverting the staple soil in moderate-sized pieces*—neither in whole slices, as in ploughing, nor crumbled too finely, as proposed by some inventors; and the pieces or spadefuls should be so turned upside-down as to bury every portion of the surface sward or stubble.

By way of helping machinists to construct a tool for the purpose, we will inquire into *the amount of power really needed in the process.* Suppose, then, that we have to cut up and invert a stratum of soil one foot deep, and that the pieces are to be one foot square and six inches thick. We cut a furrow-slice, therefore, one foot wide and one foot deep, and, instead of turning it over whole, divide it across at every six inches with a vertical cut, turning over each piece on its own axis as we sever it. How much power will be required, in the first place, *to cut off these pieces from the solid land?* Rough calculation from our broadsharing implements shows that one horse, in eight hours, can very well slice up an acre of average ground into strips one foot in width and six inches in thickness. The dimensions of these strips (in section) being just those of the pieces we are to cut, the resistance of the earth to our cutters may be taken to be the same as that opposed to the broadshare; so that we may estimate the power required for our operation by that expended in the other. The horse will have divided the staple into slices, having 58,590 square feet of cut superficies (that is, taking only two sides of each slice) by travelling at the rate of two-and-a-quarter miles per hour, and drawing with a draught, say, of twenty stones. Thus, by expending a power equivalent to the raising of 22,785 pounds one foot per minute, the horse cuts 122 square feet every minute; so that a mechanical horse-power, which is always reckoned as lifting 33,000 pounds one foot per minute, will cut 177 square feet per minute. In an acre dug as we suppose, the area of cut surface (or perhaps we might say of the cut itself, as we include only three out of six faces upon each piece) will be 156,240 square feet, which one-horse power will thus cut in 882 minutes.

In the next place, how much further power will be needed *to turn the pieces in situ*, or without lifting or shifting them more than is absolutely necessary for their invertion? It can scarcely exceed the power required to raise them bodily one foot high. An inventor of a digging machine, in writing to us, says that, as a horse-power is able to raise 33,000 pounds one foot per minute, one-fourth of a horse-power should lift an acre of land a foot in thickness one foot high in five hours; but he here makes the common mistake of forgetting that this estimate refers to a velocity of 1 ft. per minute *maintained*, and not generated, in a weight of 33,000lbs., and that by the laws of dynamics *double* the power is required to create that velocity in a weight previously at rest. An acre of land, 1 ft. thick, at an average gravity of 100lbs. per cubic foot, weighs 3,906,000lbs.; and one horse-power can lift it from a state of rest to a height of 1 ft. in 237 minutes. And adding together the two data, and stating the result in another form, we have $3\frac{3}{4}$ *horse-power able to cut and invert in the manner supposed* 2 *acres in* 10 *hours.* Of course a considerably greater force must be exerted at the crank-shaft of the steam-engine we might employ to actuate our digging-machine, in order to overcome the friction of bearings and the inertia of the moving parts. Neither is it expedient for a machine to cut *rectangular* pieces of soil, as we have supposed; still our calculation gives some idea of the nett power required when the pieces, of whatever modified figure, are of a similar bulk and weight.

Now, as our material, the ground, cannot be "fed" to the machine, the latter must be moved forward to grapple with it, which will necessarily involve a further amount of power. There are two ways of doing this. One is to drag the digging apparatus, like any other implement, by traction from a stationary engine; by which power is wasted in drawing the rope or chain, and in being at a distance from its work, while the necessary shifting of pulleys is troublesome and expensive to work. The other plan is, to attach the digger to a locomotive engine; by which means it can have an

independent revolution, instead of a mere rolling motion; but power is lost in propelling the heavy engine over rough, soft, or hilly ground.

It is the business of inventors to battle against one or the other of these disadvantages, to which the steam-engine *must necessarily submit* in attempting the labour of field tillage. We have done our part in showing what a comparatively small amount of effective power is essential for dividing and inverting (and of course more or less crumbling) a staple of soil 1 ft. in depth.

Shallower operations, such as stirring and pulverising, will be effected with much greater ease and rapidity.

ANNIVERSARY DINNER OF THE LONDON, OR CENTRAL FARMERS' CLUB.

Even in his habits and appearance the British yeoman is a very different man to what he was but a few years since. You marked him down then readily enough as one of a very isolated class—the brown-topped boots, brass-buttoned coat, and low-crowned hat, carefully brushed the wrong way, all tended to distinguish him, whenever he did chance to appear in the busy haunts of men, as one of a peculiar race. You recognized him in the plays of the time by his loud voice, his big stick, and his liking for strong beer. Novelists and caricaturists were equally kind to him. He was rated as a very honest, ignorant fellow when he was at home, and as a very easy dupe when he was abroad.

All this, however, is very different now. The English farmer may mix with his fellow-men without any of that half-patronizing, good-natured banter with which he was once so certain to be greeted. And mix with them he does, too. Take him either in his own home, or in any place of public resort, and you will find that he is seldom behind others in the refinements and comforts of advancing civilization. Despite the curse of "Colville of the Dale," the voice of music shall be heard in his house; while a son, fresh from the precincts of "the College," or the hands of Mr. Nesbit, may not only talk but practise the arts and sciences. And the head of the family, moreover, when he ventures forth, will go even beyond his weekly market, or rent-audit. One day he is himself a welcome guest at a Society of Arts; another, he has a becoming place in an Exhibition of the country's wealth and enterprize. Here he is debating his own rights at his own Club: and there discussing with the chief of another kingdom the merits of his flock, or the pleasures of his visit. This one week in London—the next in Paris—making everywhere the most of that open holiday which precedes his harvest operations, and finishing it with a stroll through the Crystal Palace, a dip at Brighton, or a dinner at Greenwich.

This is all according to precedent. When my Lord Palmerston, Lord John, or Lord Derby, as the case may be, finds that at last the Session is coming to an end, his Lordship intimates to Mr. Quartermaine that a whitebait feast will be wanted for such a day. Profiting by so excellent an example, the session of the Bridge-street Parliament concluded with a dinner at the Crown and Sceptre on Monday, July 2. In other words, the London or Central Farmers' Club, now adjourning to November, thus celebrated their twelfth anniversary. It is satisfactory to see, from the appended brief report that they never did so under better auspices. The Club would appear to be in every way flourishing. It has a greater hold on the attention of the country, while its proceedings certainly warrant the support it is receiving.

We have no need to advocate the Farmers' Club. It is just one of those institutions which must speak for itself. It is only fair to add, that the London Club has spoken for itself, and spoken out, too. Even in the business of this last half-year, as reported from time to time in our columns, how many important points have been considered! Mr. Mechi declares that it is disgraceful to the agriculturist that the sewage of our large towns is not made more use of. The Committee of the Farmers' Club politely asks him to show them how to do so. The wonders associated with the cultivation of Italian rye-grass, and by what system effected, can be fully detailed. The Club will be very happy to hear them. And land, after all, is to be ploughed by steam—a member of the Club is learning the secret, and up he comes to tell his fellows something about it. A gentleman who has just been discoursing very eloquently and usefully on drainage is requested to speak again on a farmer's further need—good roads; while another submits, with a very good grace, to be cross-examined by every practical man in the room as to the advice he has proffered on the cultivation of root-crops.

In considering questions of this kind, the London Club has done so with one peculiar advantage. It has no great men. Now and then, to be sure, a high authority, such as Mr. Jonas Webb, Mr. Hudson of Castle-Acre, or more fre-

quently Mr. Baker of Writtle, may join in; but these are still farmers with farmers, and every man speaks out as he thinks. It is this which distinguishes the one from the other. The Royal Agricultural Society has perhaps, of a necessity, something of an aristocratic tendency: landowners, dukes, lords, and squires of high degree, generally preside at its council-tables. The Club, on the other hand, we repeat, receives no such colouring or influence. And if, indeed, the comparison is to be fairly carried out, the one is as much a House of Lords as the other a Commons' Parliament.

It was satisfactory to hear how very unanimously the advantage of this kind of club association was admitted: how member after member rose to express how much he had profited, as well as enjoyed, by this direct communication with his fellows. May we not say that periodical meetings of this character have done much to effect that change we began by referring to? Have they not, to use a phrase of the day, drawn the farmer out? Made more-and-more a man-of-the-world of him? and taught him how to take, and keep his place against all comers? In a notice which we lately met with, of the Oxford Club Essay, we saw it gravely asserted that these club meetings of agriculturists led chiefly to habits of intemperance and immorality. The writer must have let his imagination or memory wander back to an age long since passed away. Few who know anything of the conduct of our Farmers' Clubs generally, but who could contradict so manifest a libel. Agriculturists now, like other classes, rarely meet together or travel abroad without profiting something by the occasion. Few such judicious associations of business and pleasure can lead to evil; and whether it be a trip to Paris, a day in London, or a dinner at Greenwich, we would counsel all to regard the holiday with a kindly feeling.

CENTRAL FARMERS' CLUB.—The anniversary dinner of this club took place at the Crown and Sceptre, Greenwich, on Monday, July 2. Mr. B. P. Shearer, of Swanmor House, in the chair, supported by a strong muster of members and their friends from different parts of the country. Essex, Bedfordshire, Berkshire, Hampshire, Lincoln, Surrey, Kent, Hertfordshire, and Wiltshire, were all well represented. After the usual loyal toasts, amongst which Capt. Aitcheson returned thanks for the Army and Navy, the chairman proceeded to the especial one of the evening. In doing so, he dwelt upon the proud position the club now holds, and the increasing support it is receiving. He might mention, as a convincing proof of this, that within the last six months more new members had been enrolled than during the two previous years. Mr. Baker, of Writtle, duly answered for the club, as well as for the compliment individually paid to himself, and Mr. Skelton for the committee; while the health of the chairman was given by Mr. Trethewy; and the Royal Agricultural Society, and the Smithfield Club, by Mr. Bradshaw. Mr. Thomas Owen, following this, proposed the Local Farmers' Clubs; in replying to which Mr. Body, as chairman of the Northiam Club, referred to the growing interest with which the provincial associations now regard the proceedings of the central one. Mr. Corbet responded to the "Secretary;" and the other toasts included the "Visitors," "The New Members," "Fox-hunting," and the "Agricultural Press," with especial thanks to *The Mark Lane Express* and *Bell's Messenger* for the manner in which they continued to report the meetings of the club. The day was altogether a most successful one, and was indeed considered to be one of the most encouraging since the establishment of the society, now some twelve years since. It would be unfair not to notice the very perfect manner in which the dinner was served by Mr. Quartermaine; or the very great addition to the pleasures of the evening as afforded by one of the visitors, Mr. Alfred Smith, of Tupwood, Croydon, a gentleman whose singing was as excellent as the songs selected were appropriate to the occasion.

ROTATION BOOK.—It is very necessary that a rotation-book for each farm on an estate be kept by the agent, so that any proprietor may see without the trouble of inspection the courses of cropping that are followed on his property. For this purpose it is required that the agent or manor-bailiff personally inspect each field on every farm at two seasons of the year, viz., the spring and in the end of autumn; and not only to state the course of cropping that is pursued, but make and note observations on the performance of the operations, and on the general state of cultivation.

Fields.	1850.	1851.	1852.	1853.	1854.
No. 1 ..	Turnips	Barley			
2 ..	Fallow	Wheat			
3 ..	Grass	Oats			
4 ..	Oats	Turnips			
5 ..	Hay	Pasture			

A book to fit the pocket must be provided, containing maps of each farm on a reduced scale, in which the observations made on the field can be entered on the spot, and are afterwards inserted in the large rotation book, containing maps on the common scale. One side of the pocket-book may be used to explain the numbers of the fields, and the other may contain the map of the farm. A book of this form may be reckoned an essential requisite over every well-managed estate of landed property.

COMMERCIAL VALUE OF INSECTS.—The cochineal insect, from which a beautiful scarlet dye is obtained, is imported to the extent of 1,000 tons annually, the value of which is estimated at 149,000*l*. From the silkworm we obtain no less than 2,716 tons of silk, 2,206 tons of which are in the raw state, and are manufactured in this country; the remaining 510 tons are already fabricated. When we consider that this quantity is the consumption of one country only, all being the produce of small insects, it appears surprising how the industry of man could collect so much and elaborate it into rich and gorgeous attire. One thousand tons of pearl shells are imported, the whole of which is manufactured into buttons and studs. "For better or for worse," we import no less than 8,000,000 leeches.

EAST SUFFOLK AGRICULTURAL ASSOCIATION.

MEETING AT IPSWICH.

From a combination of causes that it would, perhaps, be not very easy to define, this meeting of the East Suffolk Society on Thursday, July 5, was generally allowed to be the best ever known. Whether you took the chief attraction of these gatherings, and proved it at once by the show of Suffolk horses, or tested it from another point in the comparative strength of the other classes, the deduction was equally satisfactory. Not only cart horses, but riding horses; not only in Suffolk horses, but in Suffolk cattle, with sheep, pigs, and implements, you still heard but the echo of one opinion—There never was such a show: there never were so many, or so many good animals: while there never were more people to look at them.

There can be no doubt that the change in the time of holding the meetings has something to do with such very signal progress. This is now the second year that the society's meeting has been brought on from the autumn to midsummer; and with the second trial we have still more encouraging evidence as to the good policy of the alteration. It would seem to be just the season of the year to bring out the Suffolk horse in his best form; for he appeared almost to equal advantage through every class, from the full-crested stallion—that very tower of strength and substance—down to the foal which followed at the foot of the fine roomy mares. "The Suffolks," it is very evident, are coming in much greater force than they ever yet have done. On Thursday, instead of two or three good-looking animals in each division, you had to pass on from number to number through a whole page or two of the catalogue. There was, too, another very significant sign, in the prizes awarded. Breeders, who hitherto have rather played the bull in the china-shop at these meetings, and simply rung the changes by taking first here and second there, over-and-over again, have it no longer quite so much their own way. It is true—and there was no better proof of this than Ipswich, on Thursday—that the stock of these established men is not retrograding. Far from it, we should say; but others, again, are progressing. Our readers will see some names ranking high in the prize list, not quite so well known to the world as others who come in here a little lower down, and who have often to be content with a commendation instead of the usual red ribbon. Luckily there is room for them all; especially if they are willing to have their sorts better known further from home.

This is a matter worthy of some consideration. As Mr. Randall, one of the judges, remarked, he had no idea until he came into Suffolk that such a number of good horses could be brought together. He had seen the breed at meetings of the Royal Agricultural and other societies; but he had seen nothing like these. In fact, many of the Royal Society winners were fairly beaten here. This lesson should be easy enough of a reading. Horses that were good enough to rank first at Ipswich will stand well anywhere.

It is not our intention to go into the merits of the different entries or classes. We might, indeed, fairly pass them with the common critique already recorded — that they were generally excellent. Some of the younger stock, certainly, gave far more than ordinary promise; and though it is said that it is now impossible to improve on the Suffolk horse, some of the colts and fillies exhibited, should they only "train on," threaten really to do so. The very number of the entries would prevent our dwelling for long on any particular animal; while, beyond this, there was a little want of management that would rather disturb any reference to our notes. We had gone on some way into the catalogue, admiring and comparing one with another, and endeavouring to fully appreciate the "points" of the Suffolk, when we found we were in some measure going wrong. There being no time to publish a prize list, the best animals are consequently to be distinguished—the first by a red, and the second by a green bunch of colours. These, somehow or other, became strangely misappropriated. Horses not even commended had red ribbons tied to their heads, and *vice versâ*, real winners were not distinguished at all. In some of the classes the competition was so close, that we passed on, fully ready to admit that the judges might be the best judges after all. When, however, we were taken up to a mare adorned with green ribbons, and asked to explain how she was better than another with no colours at all, one really became more sceptical as to the justice of the decisions. Some of these mistakes were not rectified until comparatively late in the day. It is not easy to understand how they could be made at all; while

the ill-feeling and disappointment they must have given rise to, let alone the way in which the public was misled, is much to be regretted. It is only fair to say that no blame rests with the judges themselves.

The success of the meeting, in fact, would seem to have been almost too much for the management. After you had duly gone through the Suffolks, there came a crowd of horses, colts, mares, and fillies, for riding or driving purposes, rarely standing with such regard for their arrangement in the catalogue, and consequently very difficult to follow. The show here, too, was very strong in most respects—the cobs and some of the hacks especially good, while the mares and fillies showed not only in their looks, but by many of their pedigrees, that the Suffolk breeders are getting their riding horses well crossed on both sides. In the face of this, it was rather curious to find but one thorough-bred stallion on the ground, a Melbourne horse, called "The Lion," that has now for three years in succession taken the premium: on the first occasion only with anything to compete with.

In the red Suffolk cattle, said by many to have all those milking qualities some would import from elsewhere, the struggle was chiefly between Mr. Badham, long known as breeder of them, and Mr. T. Hudson, of Wareham (a son of Mr. Hudson, of Castleacre), who has but lately taken to the sort. It will be observed, however, that he has already made a great head, and at least divided the honours of the day. In the other breeds of cattle, Mr. Crisp was almost the only competitor with some of his short-horn blood, which, however, well deserved the premiums awarded. His bull, indeed, was a winner at Paris. In the sheep, again, another well-known name from Norfolk did great execution. It has been for some time a complaint that although Suffolk men show in Norfolk, the latter did not come into Suffolk. Mr. Overman, of Weasenham, has at length answered the objection. He sent some Southdown sheep, which took everything they tried for. It would have been strange indeed if they had not. They were the common admiration of everyone who saw them, and Mr. Sexton cannot be disgraced when thus defeated. There was a pen of five ewes from the Weasenham flock that should be tried in even better company. It was reported, though, that Mr. Overman's sheep were not entered at Carlisle. In addition to these, Mr. Sexton showed one or two very superior Cotswolds, and Mr. Aylmer, of West Dereham, a number of Leicesters, which the rules of the society would only allow to be highly commended as extra stock. The sheep show was altogether a very strong one.

The same may be said of the pigs, in which there were a number of commendations in addition to the prizes we give in our list—Mr. T. Crisp and Mr. M. Biddel highly commended for nearly all they exhibited. These commendations, however, as at present published, would be of little service without the catalogue. They should, surely, follow on in each class after the second prize, instead of being read one division in with another at the end of the list.

"Much as I love an engine, I feel I love a horse still more." So said Mr. Allan Ransome in one of those flowing genial speeches which reporters, it would seem, yet endeavour but in vain to follow. So is it with the Suffolk show: directors and spectators love the horse still more, and excellent as it was, the implement department came in for but secondary consideration. No premiums are given, but most of the makers in the county were to be found here. Amongst them the Messrs. Ransomes, the Garretts, Turner, Smith and Sons, and Payne and Girling. The steam-engine was the great feature of this exhibition; and there was, in fact, no attempt at that general collection of farm implements we are so familiar with at meetings where the prize list extends more directly to the art of cultivation.

We subjoin to this the award of premiums, with such of those addresses which were delivered at the dinner, as come more legitimately within the columns of the *Mark Lane Express*. It is but right to say that the speaking was particularly good. Lord Stradbroke himself set an excellent example. What his Lordship had to say to the men of Suffolk will be well worth a reading beyond that county. The steam-engine he refers to is that of Messrs. Boydell and Glasier. There is other matter as suggestive in the president's remarks that we may take occasion to return to. Sir Fitzroy Kelly, again, came well armed; while Sir Edward Gooch was quite at home with his audience and his subject; and Mr. Fisher Hobbs more than usually energetic as to "how they manage these matters in France." The oratory, in fact, was worthy of the exhibition—"it never was better."

LIST OF PRIZES.

JUDGES.—AGRICULTURAL HORSES: Mr. Hugh Green, Mr. George Parsons, Mr. Charles Randall. RIDING AND CARRIAGE HORSES: Mr. H. Overman, jun., (for Sir Henry Oxenden,) Mr. Thomas Ellis, Mr. George Appleton. CATTLE, SHEEP, AND SWINE: Mr. William Rigden, Mr. George Read, Mr. James Turner.

AGRICULTURAL HORSES AND COLTS.

	£
To the owner of the best cart stallion, Mr. Charles Cordy..	10
Second best, Mr. T. Catlin's executors	5
Best 3 year old cart stallion, Mr. W. Wilson	5
Second best, Mr. W. Stearn..	3
Best 2 year old entire colt, Mr. W. Wilson..	4

Second best, Mr. W. Laws .. .. £ 2
Premiums (given by Mr. R. Garrett) for the best 1 year old entire colt, Mr. J. Williams 3
Second best, Mr. W. Wilson 2
Best mare with foal at foot, Mr. S. Wolton 5
Second best, Mr. M. Biddell.. 3
Best foal, Mr. T. Catlin's executors 5
Second best, Mr. M. Biddell 3
Best gast mare, Captain Barlow 5
Second best, Mr. N. G. Barthropp 3
Best 3 year old filly, Mr. T. Catlin's executors 5
Second best, Mr. J. Williams 3
Best 2 year old filly, Mr. J. Wrench 4
Second best, Mr. Charles Frost 2
Premium (given by Sir E. S. Gooch, Bart., M.P.), for the best 1 year old filly, Mr. W. Wilson 3
Premium (given by Sir E. S. Gooch, Bart., M.P.), for the second best, Mr. J. Williams 2

RIDING AND CARRIAGE HORSES.

Premium (given by his Grace the Duke of Hamilton for the best entire cob, Mr. W. Wilson 5
To the owner of the best entire thoroughbred horse, Mr. Waller (The Lion).. 5
Best entire horse not thoroughbred, Capt. Barlow .. 5
Premium (given by his Grace the Duke of Hamilton) for the best cob mare, Mr. J. Edwards 5
Best brood mare with foal at foot, Mr. J. Hedge 5
Best foal for riding purposes, Mr. T. Capon 5
Best foal for carriage purposes, Mr. G. Waller 5
Silver cup (given by Captain Barlow) for the best foal by "Robinson," or by "Vanguard," Mr. T. Capon.
Premium (given by Mr. Waller) for the best foal by "The Lion," Mr. C. Jeaffreson 5
Best 3 year old riding gelding, or filly, Mr. Joseph Hare .. 5
Best 3 year old carriage gelding, or filly, Mr. R. Welton .. 5
Premium (given by Sir E. S. Gooch, Bart., M.P.), for the best 2 year old riding gelding, or filly, Mr. James Cook.. 4
Premium (given by F. W. Hobbs, Esq.), for the best hackney mare, or gelding, under 7 years of age, Capt. Barlow 5
Second best, Mr. G. Sexton 3
Premium (given by Mr. Brown, of Dennington), for the best foal by his horse "Mercury," Mr. James Read .. 2

CATTLE, SHEEP, AND SWINE.

To the owner of the best Suffolk bull not under 2 years of age, Mr. G. D. Badham 5
Second best, Mr. A. W. Crisp 3
Best Suffolk bull under 2 years of age, Mr. T. Hawkins.. 3
Second best, Mr. G. D. Badham 2
Best bull of any other breed not under 2 years of age, Mr. T. Crisp 5
Second best, no entry 3
Best bull of any other breed under 2 years of age, Mr. Thomas Crisp 3
Second best, Mr. Thomas Crisp 2
Best Suffolk cow, Mr. T. M. Hudson, Wareham 5
Second best, Mr. J. Gentry.. 3
Best three-year-old Suffolk heifer, in milk or calf, Mr. T. M. Hudson 4
Second best, Mr. G. D. Badham 2
Best two-year-old Suffolk heifer, Mr. G. D. Badham .. 4
Second best, Mr. G. D. Badham 2
Best one-year-old Suffolk heifer, Mr. T. M. Hudson .. 2
Second best, Mr. G. D. Badham 1
Best cow of any other breed, in milk or in calf, Mr. N. G. Barthropp .. .. £ 5
Second best, the Rev. R. Moore 3
Best three-year-old heifer of any other breed, in milk or in calf, Mr. N. G. Barthropp 4
Second best, the Rev. R. Moore 2
Best two-year-old heifer of any other breed, Mr. Geo. Hare 4
Second best, Mr. N. G. Barthropp 2
Best one-year-old heifer of any other breed, Mr. N. G. Barthropp 2
Second best, Mr. N. G. Barthropp 1
Best pure Down tup of any age, Mr. Henry Overman, Weasenham 5
Second best, Mr. Henry Overman 2
Best shearling pure Down tup, Mr. Henry Overman .. 5
Second best, Mr. Henry Overman 2
Best tup of any other pure breed of any age. No merit.. 5
Second best. No merit 2
Best shearling tup of any other pure breed, Mr. G. M. Sexton, Cockfield 5
Second best, Mr. G. M. Sexton 2
Best pen of 5 shearling Down ewes, Mr. Henry Overman 5
Second best, Mr. J. Hare 2
Best pen of 5 shearling ewes of any other pure breed, Mr. G. Mumford 5
Second best. No merit 2
Premium given by Mr. R. Garrett for the best pen of 3 fat shearling wethers of any breed, Mr. J. Hare .. 2
Best boar, Mr. M. Biddell 3
Second best, Mr. G. D. Badham 2
Best sow and pigs, the latter not to exceed 12 weeks old, Mr. H. Biddell 3
Second best, Mr. T. Crisp 2
Best breeding sow, Mr. T. Crisp 2
Second best, Mr. M. Biddell 1
Best pen of 3 sows pigged since 1st January, 1855, Mr. M. Mumford 2
Second best, Mr. S. Welton 1
Best fat ox, or heifer, under 4 years of age, bred by a member, Mr. T. Crisp 4
Second best, Sir E. S. Gooch, Bart., M.P. 2

THE DINNER,

To which about 250 sat down, was laid out in the Corn Exchange, the Earl of Stradbroke in the chair, supported by Sir E. S. Gooch, Bart., M.P.; Sir Fitzroy Kelly, M.P.; Mr. G. Alston (from America); Lieut. Col. Adair, M.P.; Mr. F. W. Schreiber; Mr. P. Bennet, M.P.; and Col. Brown. Sir E. C. Kerrison, Bart., M.P., officiated as Vice President; and there were also present Messrs. J. G. Sheppard, W. Long, jun., Henry Sheppard, J. H. L. Anstruther, J. Chevallier Cobbold, M.P., the Hon. and Rev. F. De Grey, Mr. F. C. Brooke, the Rev. E. B. Lockwood, the Rev. E. Wade, the Rev. R. Cobbold, the Rev. Dr. Rigaud, Capt. Barlow, Messrs. G. D. Badham, N. Barthropp, W. F. Hobbs, J. Wood, G. Josselyn, H. G. Bristo, F. Wade, E. M. Wade, Keer, Edwards, N. G. Barthropp, R. Garrett, J. Abbott, A. Ransome, Bond, Wilson, Haddon, Hawkins, Last, Bowers, Freeman, Corday, Sexton, Crisp, H. Overman, T. Hudson, Jeaffreson, Foster, Cotton, Chapman, Bloxam, Wolton, Fitch.

Following the customary loyal and patriotic toasts, Sir E. Kerrison gave the health of the President, Lord Stradbroke, who in replying, said that—On the present occasion he would endeavour to enlist their sympathies upon one or two new subjects—one in particular, which had lately occupied the public

mind, and which was looked forward to by men of great ability in this country as of much importance—he alluded to agricultural statistics, which so many hoped to see carried out in England and in Scotland. They were well aware that, during the last two years, attempts had been made in Scotland, and in some counties in England—and it was no small compliment to say that the county of Suffolk was one of those so selected—to endeavour to arrive at a fair result of what was the probable amount of corn grown as the actual food for the great body of the people in this constantly increasing manufacturing and commercial country If it appeared, as he thought it must do, that correct returns on so important a subject would be of much advantage to all, it was, as he thought, equally clear that if there were one class more than another who would profit by such results, it was the agriculturists themselves. They were aware that in the month of July the corn merchants had for many years been in the habit of sending round to every part of the country to ascertain the probable amount of growing crops, and that they had, consequently, in the month of September, been able to take some little advantage of the farmers, by knowing more than the sellers could probably be acquainted with. The result had been that farmers had sometimes sold their corn too soon, when it would have been wise to retain it; while at other times they had been induced to retain their corn, when it would have been to their advantage to have parted with it. If they could only ascertain from year to year whether the crops were likely to be above or below the average, at least they would all be upon terms of equality, and be subject to less fluctuations than had been observed during the last seven years, which, he thought, had exceeded the fluctuations of any other period throughout his experience. Now, in stating to them that the county of Suffolk was one of those selected, he was happy to say that in 13 unions out of 17 the public expectation was not disappointed; for they had sent from these unions very correct details, considering the opportunities which had been presented for collecting them. If he referred to those four unions which either omitted to send in, or at all events furnished very imperfect returns, he should do so, not with any intention of casting any slur upon them, but in the earnest hope that, whenever again called upon, after the mature consideration which the whole subject had undergone, having had the advice and assistance of the leading gentlemen and agriculturists of their own districts, the farmers would feel the great importance of the whole question, and vie with those unions in the eastern part of Suffolk—he particularly alluded to the Plomesgate, the Blything, and the Wangford—where an example had been set, which had not been exceeded in any other part of Scotland or England in the full and satisfactory returns which had been furnished. From even what had transpired already, he was enabled to draw some comparisons of the results arising from the mode in which the land had been cultivated in this and the neighbouring county of Norfolk. They were well aware that there were few, indeed, he did not believe there was any, county in this country where the farming was better carried on than in the county of Norfolk; and if they remembered that the area of Norfolk, compared with the area of Suffolk, was as 16 to 11, it would be found that the quantity of land upon which wheat and barley were grown in the past year was nearly to a similar extent. But, with regard to other crops, there was a vast and serious discrepancy with which it would be well perhaps for this country to become fully acquainted. He found that in the past year in Norfolk there were grown 161,186 acres of turnips; while in Suffolk, so far as it had been ascertained, the quantity grown was 62,664 acres. This was rather a remarkable difference, considering the great similarity of the soil of the two counties. Of potatoes there were grown, in Norfolk, 1,958 acres, while the number was only 808 for Suffolk. Of irrigated meadows in Norfolk the number of acres was 15,926, while in Suffolk the number was but 6,390. And when the return of sheep and lambs was taken at nearly a similar period in Norfolk, it was found to amount to 841,601, while in Suffolk it was but 405,944. He would trouble them now with only one or two more figures. Of bare fallows, in the whole county of Norfolk, there were 10,202 acres; in Suffolk, the number amounted to 41,923. If, then, we took into consideration the difference of size of these counties, we should find the waste of land in bare fallow in Suffolk to be six times as great as in Norfolk. He was well aware there were many gentlemen present who had often considered in their own minds what course could best be adopted to cultivate a crop on land which was called long summerland fallows. It was a subject of much difficulty. A near relative of his own had, in 1853, taken possession of his property in East Sussex, where he might say, without exaggeration, the farming was by no means commensurate with what they saw in this district. Upon the farm he had drained two fields with tiles, on one of which he had grown a crop of wheat which had yielded in 1854 10 coombs per acre, on land which had previously never grown more than six. On the other field he grew a crop of Swede turnips, which produced above 17 tons per acre on land where a turnip had never before been grown. This had been done at an expense of £5 per acre; so they saw that, with the prices which he received last year, he paid himself in the first twelve months for this extra expenditure. He thought these results were encouraging, and that it would suggest whether something could not be done to improve the system of long fallows. The next point to which he would allude was as to the difference which appeared to exist on many of the large farms in Cambridgeshire, as compared with the farming in Suffolk. He found that in Cambridgeshire a new system had been introduced. By many of the principal farmers there had been carried out a plan of steaming a large quantity of the food given to cattle and sheep during the winter months. He had taken some slight pains to ascertain the result, and he found that all who had tried it spoke most highly in its praise in an economical point of view. He hoped, therefore, it was not too much to say that this system might be also carried out in Suffolk, because he believed it would be of much advantage, more particularly at a time when food is scarce and prices high. Yet when they talked of high prices, it was a relative subject. Though prices were high now to what they had been, he understood from a gentleman of good authority, who was at the present moment employing a vast number of people in making a trunk line of railway through Canada—he had no doubt they were aware to what gentleman he alluded—at this moment, the prices of flour and beef were higher in that colony considerably than in England. Amongst the many expenses to which in farming operations they were liable, there were none, he thought, so great as the expense which they were all put to in maintaining and feeding cart-horses. It was calculated that the horses on every farm consumed one-fifth of the entire produce. If, then, the fact were as he had stated, it would not be too much for him to remind them that, some years ago—he was afraid he must say twenty years—he alluded specially to that subject, and ventured to suggest that which at the time was considered to be a mere theory—a theory which induced some to feel sincerely for him rather more of pity than anything else; he might say a regret that he should have ventured to touch on such a subject, consider-

ing as they then did, that he had committed a mistake. The fact was, there was then an apathy upon the subject which led to disbelief; but they had now lived to see the day when the land of this country could be ploughed without the aid of horses, and without consequently the enormous expense to which the farmer hitherto had been rendered liable. It had been his good lot, in company with two gentlemen now present, to witness an exhibition of the trial of a piece of machinery which had most effectually ploughed the soil—land, too, of considerable hardness—to a great depth, that machinery as they were assured, being capable of ploughing 15 acres per day in ten hours, and thus doing the work that thirty horses would have been required to perform. When he said this, however, he did not tell them that this piece of machinery was so complete as to be at all points in perfect condition; but it would be exhibited at the Carlisle meeting with other machinery of a similar character, at the end of the month; and he believed he was authorised to state that by the end of the present year, any gentleman present would have the opportunity of seeing it tried in Suffolk. He was one of many that day who had taken the opportunity of examining the stock which was brought to the ground, and the machinery which had been exhibited. He believed he should be correct in stating that on no former occasion was there so perfect an exhibition of improved machinery, or one in which had been displayed so vast an amount of improved skill as had now been shown by the manufacturers of Suffolk. He would also state of the stock generally, in which he felt that all would agree, that the exhibition of that was also of excellent quality and character. With regard to the agricultural interest of this country at large, they all felt that during the last two years they had enjoyed much prosperity, that prosperity not having been confined to the landlords and to the tenants, but having also extended itself to the labouring classes. The latter had had, during the whole of that time, not only the advantage of increased wages in proportion to the price of flour, but they had had a still greater boon—he meant a greater demand for their services—a greater desire to employ the wives and families of the labourers; and consequently they had been in so prosperous a condition, as to render the amount of crime in Suffolk most trifling; and if this state of things should last much longer, notwithstanding the misfortunes of the war, he hoped to live to see the day when they might leave their prison doors open. These benefits, as a leading and powerful interest in this country, they had been the means, in great measure, of promoting; and he felt himself entitled, therefore, to say that, at no former period had they met under much happier circumstances. If he wished to propose any alteration in the rules and objects of the society, there was one subject to which his attention had been drawn that day, he alluded to the possibility of establishing some means by which the flock-masters might facilitate the sales of their wools. With these remarks his lordship concluded by proposing Prosperity to the East Suffolk Agricultural Association.

Sir E. S. Gooch, in returning thanks for the county Members, could conscientiously say, that he had never seen so good a show as on the present occasion; for the animals were not only better in quality, but more numerous. They had also a numerous attendance of gentlemen, which was most satisfactory to all; indeed, they had one gentleman amongst them who had crossed the Atlantic. He repeated that what he had seen had afforded him excessive pleasure. He had been astonished at the Suffolk cobs, or ponies. His friends on the other side of the Atlantic had been wishing for animals of this description; they might now be supplied to advantage. He had not the advantage of being at the show the other day in Paris. He could say, however, that if they were to have a large importation of cattle from France, he hoped they would breed their stock from the Suffolk shorthorn bulls; for it was evident, at present, that we enjoy better beef than our French neighbours. They could now, as agriculturists, rejoice over their prosperity, and long might they do so. In going through the county they could now see a great difference: he alluded to better buildings for cattle. He was glad to see these things; for it was right that landlords should make allowances for improvements; every sensible farmer being of opinion that he could not breed good animals if he had only miserable hovels to put them in. They were famed for the best cart stock in the world; and there was no reason why they should not be able to breed good riding horses. He hoped that this point would have attention. That day he had seen some good animals; a few years ago it would have puzzled a man to find a good one throughout Suffolk.

Sir Fitzroy Kelly, in also responding, said: My noble friend (the President) has been engaged in his legislative capacity, in the House of Lords, in some pursuits connected with the subjects to which he has alluded, I mean the subject of agricultural statistics. My noble friend did not inform you himself that he has lately formed part of a committee appointed to consider all that belonged to that important subject, with a view to report upon it. I trust that in the course of the session it will lead to some practical measures connected with the subject. It is impossible to overrate its importance in this agricultural county. I am aware that differences of opinion exist on many points on this question; I am aware that much disinclination exists among some parties, in some places, and under some circumstances it will be found that a disinclination has been expressed on the part of some agriculturists and small farmers to afford that kind of information to the public which they might think prejudicial to their interests; and I don't hesitate to admit—so far am I from casting censure on such objections—I am disposed to admit that those objections are to some extent well founded, because it is certain that unless all, with an equal absence of all reserve, concur in making the returns for the public good and public service, great disadvantage will be incurred by those who do make accurate returns, while others keep the secret to themselves, and the disadvantage is imposed on those who best perform their duty. Under these circumstances, it is in vain to look for returns of agricultural statistics so long as the voluntary system is resorted to. I believe and admit that we must resort to some legislative measure to effect the great good that must follow from a well considered and established system of agricultural statistics. I am well aware that in dealing as I thus do, briefly, with the question, I am alluding to subjects with which all who now hear me are practically far more familiar and better informed than I can pretend to be. It is, therefore, with the greatest diffidence that I would venture to occupy your time on such a question; but so great do I feel to be its importance, and so serious do I feel it to be to the public weal, the want of a general system of agricultural statistics, that you will pardon me for urging on your attention those considerations which shall induce you to concur with the legislature in giving effect to any measure to establish such a system in this country as will afford to the public, and to agricultural portion of the public, all the required information. You are aware that in the different countries of Europe where agriculture is conducted on a national system, returns are made and registered in the public archives. This places the French, and the inhabitants of Spain, and some parts of Germany and Italy, on a better footing than ourselves. There is no practical

farmer but at some time or other feels himself in a difficulty, and unable to determine whether it is wise and prudent to return the quantity of corn which he may have on hand, or to sell it in the market. If you consider the practical difficulty to which he is exposed, trusting to newspaper reports, or to what are more delusive, false and interested information, you will see that he is destitute of the means of judging whether he should retain or sell, and it is only from a well-considered system of agricultural statistics that information can be obtained that will at once enable a practical farmer to act on some safe and reasonable data, and to determine what is the best course to ascertain with certainty and accuracy the amount of produce in the past year, the amount of exports and imports, the amount of consumption — all that constitutes a system of agricultural statistics, and thus to be in a position, from the very elements of the data, on which to determine with safety any practical question affecting his own interest as a farmer. It is only from these returns, fairly and accurately made in every parish and farm, that such a system can be safely and well established; but if means were adopted, and I trust they will be adopted, so that every farmer in the country will be able, in the first place, to give a return of the area, how it is cultivated, and of the quantity produced, of the weight of each bushel, and all that relates to farming operations, in the course of some two years the country would be in possession of a body of agricultural statistics of incalculable advantage to the farmer; and this might be done with perfect safety if some measure were adopted by the legislature, certainly compulsory in its character, while requiring on the one hand from the farmer fair returns, and, on the other hand, completely securing all the secrecy he requires, and thus preventing all the evils which a public disclosure might produce. It is only for the farmers of this country to notify their readiness to concur in this measure. The details would be matters for practical men. If any such system be adopted I believe that it will do more to improve and increase the agricultural prosperity of this country than any measure on which the legislature has been engaged for a long time (applause).

Mr. FISHER HOBBS, in returning thanks for the Royal Agricultural Society, said: I need not tell you that it is only through societies like the present you can expect to prosper. I can only say that I shall be happy to add fresh names to the list, and I feel persuaded, when we meet next year, a short period before the great exhibition at Chelmsford, there will be scarcely a farmer at this meeting but will be in connection with the Royal Society. An allusion has been made to the excellent exhibition that took place in the great city of Paris; and though much has been said this evening on the future of our troops, and the great importance of the alliance of this country and France, I do consider that that great gathering in Paris a few weeks since will tend as much in the course of a few years to the prosperity of the arts of peace as what is now going on in the Crimea. I am well aware that for particular purposes the breeds of stock in this country are superior to those in France; but when we take into account the different operations for which the animals are used, I do believe that for many years they have paid as much, if not more, attention to those particular breeds as we have ourselves; and I only hope and trust, when we meet next year, that an opportunity will be given, not only by our society, but by the nation at large, to invite all the countries that competed at Paris to come to the exhibition of the show of animals. I am well persuaded that it will be an advantage to the country to see their breeds in comparison with our own, especially as they look to England as a market for fat beasts, and I think it is not improbable that we may take advantage of the milking properties of some of these animals. I need not go into any great lengths as to that extraordinary exhibition; though I have attended every exhibition of the Royal Agricultural Society, I assure you that no exhibition that has taken place has been so numerous, or so extensive, or so interesting, as the exhibition of Paris; and I think it is my duty as one of the jury on animals there to tell you that no opportunity has been given you through the press to ascertain the true character of that exhibition. In reference to agricultural statistics, knowing as I do the farmers of England, and moving among them, I may state that the farmers are willing at all times, for the benefit of their country, to give any information that they may be called upon to supply; but there is one point that I wish to notice, that having taken up this great question of statistics, it is of importance to others as well as to the English farmer. I look at it as a national question, and I think the great industrial body of this country will do right in making their returns as well as the English farmer. I will at once state that it is the opinion of the great body of the farmers, that in giving the statistics they are not given for their own advantage, but for the general good. I can only say if that question can be adjusted fairly the farmers will be ready to do so; but I think that it ought not to be a one-sided question that some would endeavour to make it.

The PRESIDENT briefly gave the "Health of the Judges," with thanks to them for having performed a difficult and delicate duty.

Mr. RIGDEN responded for himself and the other Judges. In doing so, he highly commended the show of stock. He had been pleased to see that at the Norfolk meeting so large a proportion of Suffolk stock obtained the prizes; and now he was pleased to see the Norfolk men returning the compliment, thus making it a tie game.

Mr. RANDALL quite concurred in what Mr. Rigden had said, expressing his astonishment at the show of horses.

The other toasts included "The Successful and Unsuccessful Exhibitors," acknowledged by Mr. H. Overman; "Agriculture, Manufactures, and Commerce," which elicited a most eloquent address from Mr. Ransome; "The Agricultural Labourer;" "The Committee;" "The Secretary and Treasurer;" and some other toasts of a local character.

A FARMER'S GARDEN.—There has been a great change within a few years among our farmers in regard to the cultivation of a kitchen garden; but there is abundant room yet left for improvement, and we would urge upon the attention of all the value and necessity of an ample and seasonable supply of garden vegetables. It speaks very poorly for the farmer's economy, even though his fields be tolerably well tilled, to see the garden fence broken down, and the plot overgrown with grass and weeds. No one can estimate, until he has tried it, the value even of a small but well cultivated garden. The constant rotation of fresh and delicious vegetables it affords for the table, and the amount it saves of the more substantial provisions, to say nothing of the higher considerations of comfort and health, are among its numerous advantages. It has usually been the case, and the same state of things perhaps exists to-day, that the care bestowed upon the garden is in inverse ratio to the size of the occupant's premises and his pecuniary ability. If a man owns but half an acre of ground or less, he makes it tell essentially in the way of vegetables and fruits; while he who boasts the possession of a hundred or more acres, ploughs and

sows broad fields, and not unfrequently lets the garden run to waste. His wife through all the early season is limited in range of edibles to the pork barrel, the flour barrel, and the potato bin, on which enormous drafts are made to satisfy the cravings of half a dozen hungry field-hands.

SUGGESTIONS FOR AGRICULTURAL STATISTIC RETURNS FOR ENGLAND AND WALES.

[*To be made on the 21st day of October in each year, and sent to the Collector within 14 days.*]

1. To appoint an intelligent agriculturist as inspector for each county, holding not less than 50 acres in his own occupation, with a salary of £60 to £100 a year, varying with the extent of the returns.

2. In Hertfordshire there are 135 parishes, and, according to "Sparkman's Statistic Analysis," the farmers are 1,900, and the collation of that number of returns by the inspector would not occupy more than 10 or 12 days; and the whole of the returns might be submitted to the Board of Trade in the month of November. And as there would be only 52 counties (some of the largest of which it might be desirable to divide), the whole of the actual returns from the county inspectors might amount to 60 or 65; and the Board of Trade would be enabled to arrive at the combined amount of the returns within a few hours' labour on receiving them from the inspectors.

3. The mode of obtaining the returns should be through the medium of the Collector of Assessed Taxes, who is a fixed officer, and in the habit of sending schedules to each occupier Any portion of such returns may be returned to the collector, sealed and addressed to the county inspector. This would avoid any unpleasantness on the part of the farmer to an objectionable surveillance of his business by his neighbours, and there would be then little inducement to make unfair returns.

4. To confine the returns to farmers and occupiers of land not holding less than 5 acres of arable land or 10 of pasture.

5. The collector of the returns to be paid 1s. for each schedule, to be paid him by the Overseers of the Poor of the parish on the certificate of the inspector.

6. All parties refusing or neglecting to make such returns shall be summoned for penalties on the instructions of the inspector to that effect, and all fines paid to the overseers of the parish.

7. The inspector for the more certainty of obtaining the returns by a given day shall despatch an agent into each Hundred of the county to collect them from the returning officers.

8. Each collector of the returns shall send to the inspector a list of the names liable to make returns in the parish, and then to have the required number of schedules forwarded to him. The inspector would enter the names in his books, and ascertain who were defaulters; and he would then have the lists in readiness to fill up on the receipt of the returns.

9. The object of making the returns so late as in October is to have a clear and correct estimate of the results of the different crops after their maturity, for all crops, particularly wheat, are liable to great injury in quality and quantity from bad harvest weather and the effects of mildew and blight when it is near maturity, for which no allowance could be made by any returns made in July or August; and the yield of the different crops would be to some extent ascertained by the quantities thrashed out previous to the 21st of October to be sent to market, and for seed.

10. The expense of obtaining the whole of the returns to the Government, if the collectors are paid by the Parish authorities (which in many instances would not exceed a few shillings, and in the largest parishes £3 to £4), would be some £10,000 to £12,000.

COMPARATIVE VALUE OF FODDER.—In the following table the best upland meadow hay is taken as the standard, at 100lbs.; and the specified weight of the other kinds enumerated are required to produce the same results:—

Good hay	100	Dried stalks of Jerusalem artichoke	170
Aftermath hay	102	Do. of Indian corn	400
Clover hay made in full blossom	90	Millet straw	250
Do. before the blossom expands	88	Raw potatoes	201
Clover hay, 2nd crop	98	Boiled do.	175
Lucerne hay	98	White Silesian beet	220
Sainfoin hay	89	Mangold wurzel	339
Tare hay	91	Turnips	504
Spurrey, dried	90	Carrots	276
Clover hay, after the seed	146	Swedish turnips	308
Green Indian corn	275	Do. with leaves on	350
Green clover	410	GRAIN.	
Vetches or tares, grn.	457	Rye	54
Green spurrey	425	Barley	54
Jerusalem artichoke, stems and leaves	325	Wheat	42
Cow cabbage leaves	541	Oats	59
Beetroot leaves	600	Vetches	50
Potato haulm	300	Peas	45
Rye straw	442	Beans	45
Oat straw	196	Buckwheat	54
Pea haulm	153	Indian corn	57
Vetch haulm	159	Linseed cake	69
Bean haulm	140	Wheat bran	165
Buckwheat straw	195	Rye bran	109
		Wheat, peas, &c., as chaff	167
		Rye and barley chaff	179

THE SUNFLOWER, OR HELIANTHUS.—This is a highly ornamental and extensive genus of plants, and from their tall growth they are particularly well adapted for the back of flower gardens, or the front of shrubberies, in which situations they make a splendid appearance in autumn. They grow well in any common garden soil; the tender kinds being protected in winter. It appears to possess far more profitable qualities than were hitherto supposed, and besides forming a beautiful object in a bed of flowers, it may be cultivated with advantage, and applied to many useful purposes. An acre of land will contain 25,000 sunflower plants at 12 inches distant from each other. The produce will be according to the nature of the soil and mode of cultivation; but the average has been found to be 50 bushels per acre of the seed, which will yield 50 gallons of oil. The oil is excellent for table use, burning in lamps, and for the manufacture of soaps. The mash, or refuse of the seeds after the oil has been expressed, and made into cakes, will produce 1,500 lbs.; and the stalks, when burnt for alkali, will give out 10 per cent. of potass. The green leaves of the sunflower, when dried and burnt to powder, make excellent fodder for milch cows, mixed with bran. From the ease with which sunflowers are produced in our gardens, for they flourish in any soil and require no particular care, we may safely say that an acre of land will yield a very considerable return. Poultry are very fond of the seeds.

HOEING—ITS PRACTICE.

No. II.

The true principles of hoeing being understood, no great difficulty will arise in the farmer's mind as to the object he must keep in view by all the operations of hoeing. Knowing the precise nature and design of *hoeing*, he will at all times exercise his best judgment to obtain the full benefit to be derived from this very important agricultural acquisition; and we can readily imagine his first inquiry would be as to the *arrangement* of his crops to suit the due use and free working of the hoeing implements he proposes to adopt; next, the order of implements he must use; and lastly, the state of the crops and soil prior to the application of the hoe.

1*st. The arrangement of the various crops, in order to derive the greatest benefit from the operation of hoeing.*—The various crops designed for *horse-hoeing* on the flat will require a regular and systematic arrangement. The drilling should correspond with the horse-hoe to be used: this is admirably effected by Garrett's drill and horse-hoe, which both take the same breadth. It should be done at such regular intervals throughout the field as to suit hoes of any width. This requires very careful and clever workmanship; because those rows at irregular intervals will be either cut up entirely by the hoe, or, which is far better, the hoe must be taken out of work and the rows missed altogether, thus merely rendering the hoeing incomplete. Where it is customary to set out the field in "lands" or "stetches," some difficulty may present itself from the depth of the furrow, and the want of skill in the ploughmen, who may not be able to keep all the lands precisely of the same width; this may, however, be easily obviated by taking a single hoe or more out of work, and finishing the land by hand-hoeing. All well-drained lands may, in the spring, be advantageously ploughed into "broad-work" (*i. e.*, without furrows or nearly so), as is done in Kent and elsewhere by the turn-wrest plough. The drilling on this "broad-work" would much facilitate horse-hoeing, as the drilling may be, under ordinary care, effected with great exactness and precision. There is no difficulty in preparing ridge-work for horse-hoeing, or other work, at wide intervals; of course the greater the regularity the better the hoeing will be done. The width of the rows in all corn crops is a very important consideration in every respect; but as I am speaking of them in reference to hoeing only, I shall confine myself to that particular. However, they should be wide enough to allow the hoes to work freely and without injury to the plants, be the crop of whatsoever kind: and *hoeing* should be *cutting*—not as with a point merely scratching up the soil between narrow rows. The crops designed for *hand-hoeing* should also, I think, be drilled, and with great regularity; particularly the turnip and similar crops. They may thus be set out with greater exactitude and quickness. In broad-cast work it is a sort of hap-hazard business, and the plants are left very irregularly. In drilled work it is somewhat mathematically done: suppose the drilling 12 inches, and the hoe to be 12 inches in width, the setting out along the row will leave the turnips standing about 12 inches square. In all corn crops drilling is indispensable to good hand-hoeing.

2*ndly. The order or kind of hoeing implements to be adopted or chosen for use.*—The common hand-hoe for all purposes of field-work will, of course, be one of the first chosen. To describe it would be superfluous: it is made for cutting—not chopping—and of every requisite width to suit all work, and occasionally with pointed corners or ends to reach more readily the weeds standing in the rows. This hoe is light, handy, and manageable by every workman. Another hand-hoe, designed for strong or gravelly land, is more adapted for chopping; and often made with prongs on the opposite side of the blade. The form in each case should be the curved back: it enters and draws through the soil easier. The Dutch hoe is not commonly used in farming operations. The horse-hoe is a far more complicated affair. The varieties are so numerous, and the degrees of merit proportionably so, that it seems invidious to name particular ones. The most approved horse-hoes on the flat, with which I am acquainted, are Garrett's, Harradine's, and the Uley and Harkes' expanding hoes. Those for ridge work are Ransome's Universal Plough (Y U Z), being adapted for every purpose of ridge culture; Busby's and Howard's having fitting parts both for ridge and flat work, and mouldboards for moulding up potatoes and trenching. The great thing is to select those that are manageable and inexpensive, and are suited to the soil, and the course of management adopted.

3*rdly. The state of the crops and soil preparatory to hoeing, in order to derive the greatest benefit from hoeing.*

Wheat and other grain crops. — These crops should be in a sufficiently forward state to throw

out their coronal roots. The coronal roots are thrown out from the plant horizontally, near the surface, or at the point where the seminal roots take their shoots downwards or perpendicularly; hence the soil requires preparing for the reception of these coronal roots, and hoeing is the adopted and most effectual means of preparation. The wheat hoeing should take place therefore as soon as the wheat plant begins to quicken its growth in the spring, providing the soil is in a proper state, *i. e.*, when it will work freely, and without clogging the hoes. It must be done at a fair depth, so as to receive these coronal roots, and yet not so deep as to disturb the seminal ones. The first hoeing should be done with the horse-hoe, to be followed in about a fortnight afterwards by the hand-hoe: the latter operation to combine weeding with the hoeing. In this way two good hoeings may be given at no great expense.

Oats and Barley.—These crops grow rapidly in the spring. The chief thing to be guarded against, in hoeing these crops, is, to let them be fairly weaned from the grain or seed before hoeing them. They should not be deeply hoed, as the roots are young and tender, and easily injured.

Beans, Peas, &c. — These crops, being tap-rooted, may be advantageously hoed at any time after they have well made their appearance above-ground—and the oftener the better, in reason; particularly the bean-crop. This crop is also much improved by a careful thinning in the rows; it aids the blooming and setting of the blossoms.

Potatoes.—This crop requires repeated hoeings, both by horse and hand-hoe. The first hoeing may take place between the rows even before the crop is up, providing the ridge-system is adopted—and which, indeed, is becoming general, as producing the best crop of large or marketable potatoes; the great object being to keep the crop clear, and the soil all open and free, ready to be moulded-up when the potatoes are sufficiently grown for that purpose.

Turnips, Mangolds, Mustard, Coleseed, and similar crops. — These crops, to be properly hoed, should be in rows or ridges. If the soil is in a fit state, hoeing, when carefully executed, may commence as soon as they make their appearance; to be repeated as often as convenient, and the state of the crop and season will permit. The more frequently the soil is stirred, in suitable weather, the faster the crops will grow. It is also one very efficient way to destroy "the fly," "wireworm," caterpillar, grub, &c.

The State of the Soil.—This is a very important part of the subject, and for the most part dependent upon the season. However, much may be done to modify the most untoward season. The farmer must be always ready and watchful to take any advantage that may arise. If the season is continuously wet, and the soil soft, his best judgment will dictate patience, if not suspension or abandonment altogether. Hoeing is not synonymous with weeding: the latter may proceed when the former may be injurious. Hoeing—that is, hoeing for purposes of aëration and pulverization—can only be properly done when the soil is capable of subdivision into particles, crumbling as it is proceeded with. A soft and pulpy soil, if hoed, will, on drying, set into clods, large or small, into which few or no fibres can penetrate. The soil should, in fact, be neither hard nor soft. Hardened soil may be benefited by hoeing, if but very imperfectly done; it may break the crust, and render it pervious to dews or slight showers: but a soft soil is best let alone, except for weeding. This must and ought to proceed, under any circumstances: cleanliness is indispensable. No implement seems better adapted for weeding than the hand-hoe in its various modifications; and the facilities given by the adoption of row culture for its use is a great improvement in farm practice, and confers the twofold benefit of good pulverization and great cleanliness by this one operation in husbandry.

No. III.

TURNIP-SOWING AND HOEING.

About this period, last year, I addressed to the readers of the *Mark Lane Express* a paper on the above-named subject, which met with some criticism from several correspondents. I resume the subject again this year, with the view of showing that the course I then advocated relative to the *sowing* and *hoeing* of turnips is the correct and true one.

Turnip-sowing.—On the sowing or drilling of turnips I need not say more than this: that I advocate a truly good preparation of the soil; that I require a great depth of loose well-comminuted mould, made all clean and right; that I advocate *drilling*, and drilling in with the seed a good dressing of suitable artificial manure upon a "*thick coat*" of well-fermented fold-yard dung; and that I advocate drilling the rows at *intervals narrower than is commonly practised*—viz., on the ridge for horse-hoeing twenty-four inches, and on the flat for hand-hoeing twelve inches—the usual distance (as commonly practised) being twenty-seven, and from fourteen to sixteen inches respectively, on ridge and flat.

These wide intervals I think excessive; and if I can show that, by paying much closer attention to the selection of the variety of turnip to be sown and the practice of hoeing, the same weight

of crop can be obtained and preserved upon each row—*i. e.*, upon rows at 24-inch intervals as upon rows at 27-inch intervals, or upon rows at 12-inch intervals as upon rows at 14 or 16-inch intervals—I prove an increase in weight of the crop amounting, on the ridge principle at 27 inches to one-ninth more; on the flat at 14 inches to nearly one-fifth more, and on the flat at 16 inches to about one-fourth more per acre. This, I am well aware, is a very startling announcement; and it will be considered an untenable position to make good, or even defensible.

In taking up this subject again, and in this matter-of-fact way—for, of course, the result must depend upon a series of well-authenticated facts taken from repeated and satisfactory trials—I am free to confess that, thus far, the greater number of instances may be against me; but this does not by any means destroy, although it may weaken, my position. I contend that the cultivation of the turnip crop, the selection of the various sorts according to their adaptation for the soil and management, the mode of sowing, the manures used, and subsequent culture, have not received that close and strict attention they require and deserve. I believe that turnip culture, much as it has progressed of late years, is still in an enlightened course of progression. I think that it has not nearly attained perfection, but that it has to experience greater improvements and a greatly extended cultivation, and that it will ultimately become a far more important branch of profitable husbandry than it has hitherto been. The growing wants of the community for animal food, and the immense quantity of food for animals thus to be raised, will fully sanction this view of the subject. I am of opinion that winter fatting or grazing in the turnip field will transcend in a great degree the summer grazing or fatting in the grass fields or meadows; that the so-called artificial grasses, owing to the same cause—*i. e.*, the immense quantity of food they produce—will to a great degree supersede and take the place of the natural grasses; and that the artificial food thus raised for stock—consisting of these various grasses, as well as turnips, mangels, cabbage, and the like—will speedily become the approved and general mode of fatting or grazing stock.

It is the raising or culture of these artificial grasses for summer service, and this vast amount of winter provender, that now gives such impetus, and will in future afford a great onward movement to the practice of agriculture; take the chemistry of agriculture—every discovery therein combines to favour this onward progress: all the adventitious aids to fatten stock; all the artificial aids to promote the prosperity of the crop designed for their food, and the extensive application of them; the improvements in the implements of culture for pulverization, drilling, hoeing, &c.; and, above all, the requirements of the times and the extension of agricultural knowledge—all point to this onward movement, this almost untrodden path in making such extended provision for the sustenance of stock, and leading to a further and greater development of our agricultural resources than we have yet attained to.

Taking, then, this wide view of the future, I proceed with *the turnip crop*. The distance I advocate, both in drilling and setting out, I would observe, is only applicable to good turnip soils, or those in a high state of culture. The soil and management must be adapted to the crop, and all its requirements *fitted for the growth of turnips;* failing this, other crops should be substituted—*coleseed, cabbage, white mustard, &c.* On soils, then, thus properly prepared, I advocate a much thicker planting of suitable varieties of turnips than is usually planted. If the top of the variety chosen is small, and the plants equally set out at 9 inches by 24, 10 inches by 16, and 12 inches by 12 respectively, they will, with careful and constant hoeing, proceed to bulb satisfactorily. It is the over-crowding that must be avoided, causing them to run to top; large-topped varieties are unsuited for thick planting, or, indeed, for any planting at all except in the poorest soils. It is a complete pavement of turnips that I aim to obtain; not a small number of large ones—these are generally of bad quality—but a full crop of bulbs of average size and excellent quality; and this I have frequently done by the close attention I have given to the proper selection of the variety of turnips I have sown, as suited to the soil and subsequent hoeings.

No. IV.

HORSE-HOEING.

Horse-hoeing in turnip culture on the ridge can be readily effected at any time and nearly under every circumstance. Horse-hoeing on the flat is not so easily or satisfactorily performed: the manure is not so well covered; the rows are trodden upon by the horse, unless at too great width. Hence I advocate horse-hoeing on the ridge and hand-hoeing on the flat, with various modifications, according to circumstances. The most important thing that I contend for is the often-repeated—almost continuous hoeing: the principles whereof I have endeavoured to point out in my late papers.

To proceed with a thorough and effectual hoeing, it is requisite to commence upon a good plant throughout. On the ridge at 24 inches I would set out with an eight-inch hoe; on the flat at 12 inches with an eleven-inch hoe; and other distances proportionately; consequently the plants will stand at intervals of 9 inches by 24 on the ridge, and 12 inches square

on the flat; making due allowance for the workman, who cannot strike his hoe to the ½-inch on either side the plant to be left. The turnips will become somewhat larger on the ridge from the superiority, as a whole, of the system; but all things being equal, the advantages in weight will be on the side of the flat system.

The course I would recommend in turnip-hoeing is to commence the first operation, either by horse or hand-hoe, as early as possible in which it can be done without injuriously disturbing the vegetative power of the seed or early growth of the plant: both must be avoided, but the sooner the better when the plant appears and the season is suitable. When a good broad leaf appears they may be set out. The third hoeing and singling should immediately follow; the horse-hoeing where practicable to be constantly proceeded with (a ridge-harrow is used in many districts—this is more effective than the horse-hoe in loose soil); in the fourth, which is commonly the last hand-hoeing and cleaning process, a smaller hoe should be used, particularly on the flat system. A small 4-inch hoe in the hands of good workmen will do great service in promoting the safe progress of the turnip crop, particularly that set out at 12-inch intervals: it is indeed necessary to aid the *bulbing process* by the continued stirring of the soil, so long as the hoe can be used without detriment to the bulbs. Injury to the tops is of little consequence: it is rather a benefit than otherwise—the great difficulty on good soils being to prevent the tops growing too fast, so as to decrease the size of the bulbs, or hinder their formation: early thinning will do much to effect this. The farmer's judgment will best decide the number of hoeings he can give with advantage. I should much regret if what I have said on this subject should lead even a single brother-farmer astray: to prevent that, I must repeat or say another word upon turnip sowing. I object to early sowing on good or highly-cultivated soils. I advocate sowing a suitable variety of turnips on a soil suited to its growth: turnips from a stock of moderate size and small top on good lands; turnips from a stock of large growth on poor lands. Early sowing and thin planting on good land will produce large turnips, but of indifferent quality, and subject to frequent mildews; but if sown at proper time, which I think should not be later than the middle of June for swedes or the 1st of July for common sorts, the plants may be left much thicker than usual, the bulbs will be of good size and of good quality, and a greater yield than is now obtained by the old method will be the result. It is not the largest turnips any more than the largest sheep that will produce the greatest quantity of food per acre—each requires its adaptation as to soil and climate; but the adaptation in this case is directly in reversion: here we want the large turnip (the large breed) for the poor soil. It is upon this adaptation that I mainly found my principle—the right turnip for the right soil; or, which is nearly the same thing, the right variety of turnip for the class of soil or of management or of culture pursued. I do not approve of small-sized varieties for any soil or mode of management. I would rather defer the sowing, and choose a larger sort—thinning the plants as early as possible; for it is often and chiefly in their earliest stages of growth that, from standing too thickly the turnip plant acquires its inclination to run to top. Its natural habit of growth is to form a bulb, and this habit must be encouraged in its early stages by early thinning. The tops in subsequent stages may overlap and intertwine a little, and in some cases may prevent some plants forming kindly into bulbs, but it will be as nothing compared with the great bulk of the crop. The turnip at 9-inch intervals by 24 must have ample room for expansion. The turnip at 12 inches square will be confined enough certainly; but I have never seen better crops of common turnips than after this plan. The red globe variety is the best I have seen for thick planting: it is a good sort, and grows to a large size without much top. Swedes in the ridges will appear too close; but having 24-inch space on the sides for the development of the plants, it will be found sufficient to mature the crop: some of the bulbs may grow a little out of form from compression in the rows, but that only shows the abundance of the crop. I will venture to assert that, with our improved mode of turnip culture, the use of adventitious aids to promote safe progress, the proper selection of stock turnip-seed to the soil, and the constant hoeings to be practised, better crops of great size and excellent quality may be raised than has hitherto been done.

P. F.

BATH AND WEST OF ENGLAND SOCIETY.—The council held their monthly meeting on Saturday, the 30th of June, at Taunton, when it was decided that exhibiters having special awards should be given the option of receiving the silver medal of the society, in lieu of money premiums. A deputation was appointed to visit Yeovil, having reference to the invitations received by the council to hold the annual meeting in that neighbourhood in the year 1856. The following new members were elected:—The Rev. Robert Baker, of Compton Martin, Somerset; Mr. James Langdon, of Barnstaple, Devon; Mr. R. Denison Jones, of Huish, Campflower; Mr. William Abery, of Barnstaple; Mr. Joshua Downing, of Horwood, Barnstaple; Mr. Edwin Trood, Mr. Willis, Mr. J. Kingsbury, of Taunton; Mr. J. H. James, of Exeter; Messrs. Hands and Welch, of Camelford, Cornwall; Mr. Robert Spiller, of Branscombe, Sidmouth: John P. Heathcote, Esq., M.P., of Tiverton, Devon; John Heathcote Amery, Esq., of Tiverton; Mr. John Francis Worth, of Worth, Tiverton.

THE ATTACKS ON THE TURNIP CROP.

The loss of plant in the turnip crop by the fly is, we fear, more universal than has happened for many years past. Complaints have reached us from every part of the kingdom, and from the midland counties especially. The devastation in the space of forty-eight hours was complete, every plant in that short period having disappeared over an extent of thousands of acres, and from the continued drought and late period of the season little chance now exists of obtaining a crop of swedes by second sowing, the only chance remaining being a substitution of the common varieties of turnips in their place.

It has struck us as very extraordinary that this pest should become universal over such extensive districts at the same time, and that it should prevail in some seasons, and not in the slightest degree be found to exist in others. Had it proceeded from atmospheric causes, as blight or mildew, we should not have been in any way surprised; but when at one precise time it is found to prevail from one extent of the kingdom to the other, then we confess we are struck with astonishment that myriads of living insects should have become animated with life at the exact period of time when food was produced in abundance for their subsistence, and that they should then disappear until another opportunity arrived for their reproduction.

Upon examination of this minute beetle, it will be found supplied with wings quite large enough for its transportation from one place to another; and that it does fly occasionally, we are convinced from our own observation, especially as swallows have been shot whilst upon wing, having them collected with other insects taken by them during the period of incubation; and although they might possibly have been taken by them when in the act of jumping from plant to plant, yet from their having wings, it is conclusive that they must have been used for the purpose of transporting them from one place to another, in search of food.

The production of insects in such large numbers in some seasons, more than in others, may depend upon atmospheric agency influencing their production; and we have invariably observed that when north and north-easterly winds are most prevalent, the greatest number of plants and vegetables become infested with them, with the aphides in particular: in some seasons certain descriptions of plants become greatly affected, and others entirely escape. The hop, the bean, and the mangold wurzel were last year nearly destroyed by them: this year all those plants enumerated at present have escaped, and other plants are more or less affected, the *salix* or willow tribe, especially the common osier, having recently become covered with them for several inches, from the tips of the shoots downwards, and which we never had in any instance remarked before. In our garden, last year, the common wormwood, growing in connection with a bed of fennel plants, was literally covered with aphides; and, singular as it may appear, the fennel is this season attacked, and the wormwood has escaped.

The turnip beetle (*altica nemorum*) is too well known to need description. It is a minute beetle, jumping quickly, and to a considerable distance whenever it is disturbed. It is also provided with wing cases and wings; and although rarely seen upon the wing, there is no doubt that it is attracted to its food by scent, and approaches it upon wing up-wind from various quarters, many of our common weeds being at all times infested with it. The common yellow, and white charlock especially, the wild hedge mustard, and common horse-radish, invariably abound with it; and it is from such sources that, probably attracted by the scent of the growing plants, it proceeds by myriads to their destruction. The fallacy of steeping the seed as a preventive becomes, therefore, apparent; as it has never been found in any way to attack the seed vessels or the seed, but deposits its eggs upon the under-sides of the leaves of the young plants, from which small maggots are produced, which burrow in a tortuous manner beneath the cuticle, until it assumes the chrysalis state, and then falls to the ground, which is accomplished in the space of about sixteen days.

It is therefore apparent that the insect is not introduced, as many imagine, by the seed; and as the time occupied in its production is longer than the period of germination of the seed, that supposition fails altogether. But if, as before suggested, it is attracted to its food by scent, it would be of little avail endeavouring to prevent its ravages when it has once established itself upon the plants; the greatest chance of any successful result would arise by destroying hedgerows and weeds, that encourage the production of the insects, or by rendering their food obnoxious to them, which to a certain extent we may effect; but, after all, by stimulating the plants into rapid growth by active manures would appear to be the most applicable and ready mode, and indeed is the one now generally resorted to for effecting that object.

Whenever the plants are exposed to the full action of the sun, they not only grow more slowly, but are more liable to be taken off by this insect, than when they remain partially shaded from its influence. For this reason, many of our best cultivators leave the rills formed by the coulters of the drill untouched; and when sufficient moisture exists in the soil to perfect the germination of the seed without rolling down, it is better not to roll the land after drilling. But, upon the appearance of the flies, the land should be rolled early in the morning—not with the intention of killing them, but of rendering their food unpalatable by causing the dust to adhere to the leaves; and for this purpose, road-dust sown thickly over them, when covered with dew, has been found successful. Soot will also effect the object; but lime is not of much avail, as it so quickly loses its caustic quality after exposure to the air. As the white or common turnip is eaten by them, in preference to the Swedish variety, it has been found that if seed of that plant is drilled in adjacent rows to the swede drills, about three days after drilling the former, the insects will feed upon the latter in preference, and the swedes thereby escape much injury: the surplus plants sown for them can be easily hoed out, should they not be eaten off. After many years watching them attentively, and ascertaining their habits, this is the conclusion we have arrived at—their attack is so sudden, and the destruction of the plants so quickly effected, that nothing but prompt action can counteract their attack. This would be difficult to effect upon extensive tracts of land at the same instant of time, and it might be only necessary to attempt it in rotation as the sowing had previously proceeded. Rolling and hoeing appear to answer well: the plants becoming covered with dust by either operation, and the plants at the same time being stimulated into growth; and unless in process of time some substance may be discovered so obnoxious to them as to cause their destruction, or to drive them away, we fear it will be hopeless to attempt anything beyond the simple remedial measures we have adverted to.

As the turnip crop has become next in importance to that of wheat, inasmuch as not only that, but all other grain crops become dependent more or less upon its growth, it assuredly deserves our utmost attention; and if any mode can be devised, by which it may be secured, we hold that such a discovery would be second to none that has been made available to the purposes of the agriculturist; and therefore, any attempt, however feeble, to achieve such an object, we trust will be accepted. What we have before stated, we now repeat—that our columns are open for investigation, and we consider that in this instance we shall not be considered out of order by impressing its consideration upon the minds of all agriculturists.

HOW TO PREVENT THE TURNIP FLY.

SIR,—As you have copied a paragraph from the *Cumberland Pacquet* stating that sulphur mixed with turnip-seed and damped with oil would prevent the fly from destroying the plant, and the fly being very prevalent (here, at least) this season, feeling the necessity of securing a plant of turnips if possible, from the short produce of stover and hay, I state, that no means of scenting the seed will ensure a plant of turnips in all seasons; nor do I believe that any other means exist, except by decoys of other food, which they prefer.

The fly has not been so destructive of late years as formerly at periodic intervals. The improved tillage and use of various forcing manures no doubt have prevented the destruction of many plants of turnips; but in seasons such as have occurred losses would be experienced in spite of these improvements.

I should not have ventured to give my opinion on the subject in this apparent genial season but from having seen three fields on which the turnip plants had been destroyed by the fly, and being drilled over again, on two of which I had seen guano sown on the land previous to the turnip-seed being sown, and from being questioned as to whether I still was of opinion that a plant could be obtained in spite of the fly, as I frequently asserted many years since. After trying everything suggested, accident led me to conclude that drilling common turnips thick in alternate rows with swedes would secure a plant of *swedes* from injury from the fly. I had practised this mode, and obtained a plant of swedes for several following years previous to 1825. In 1825 or '26 Mr. Layton Cooke (a member of the Society of Arts) sent me a list of prizes offered by the society; in answer to which I stated that I could not compete for any of the prizes offered, except that I could ensure a plant of swedes (one of the prizes offered). This led to a correspondence, but heard no more from the society till 1827, when the society presented me with a gold Ceres Medal. They had had the mode tried in Derbyshire, and, as it happened, the farmer obtained a plant of swedes when all others in the neighbourhood failed, from its being a fly season. This circumstance is stated in the "Transactions of the Society" of the year, vol. xlv. p. 54. And I never missed obtaining a plant of turnips from 1827 till I quitted the farm in 1850, although it was chiefly stiff clayland and wood bound; but a few years after (1827) accident led me to ascertain that mustardseed was equally efficient as common turnip, and less seed required, and that at one-fourth of the cost of common turnip seed.

In 1830 the Doncaster Agricultural Association issued a circular to 102 persons, containing twelve questions relating to the nature and habits of the turnip fly, and the best means of obtaining a plant of turnips. I did not receive a circular, but a copy of the returns was sent me (by order of the committee)

by Mr. James Ridgeway. In page 2 of the "Doncaster Report" it is stated that, "the enormous losses periodically occurring from the turnip fly have necessarily led to inquiries after the means of prevention or cure. Many plans have been tried with partial success; and from time to time such plans have been published to the world as unerring remedies for the disease. A few years' trial on an extensive scale has, however, generally shown that such conclusions have been formed on too narrow an observation; and that particular circumstances of season or locality have produced the effect which had been ascribed to some general cause, applicable alike to all seasons and places, without exception."

I am quite aware of the conflicting opinions on the practicability of ensuring a plant of turnips, and of the danger of venturing to offer a decided opinion that this is a fact. The Doncaster circular contained twelve questions, and the summary, of course, twelve answers; in some of which the remedy may be as bad as the disease, others not generally practicable. The real question to solve is, can a plant of turnips be obtained without increasing the cost of manure or seed?

I am, sir, your humble servant,

Witnesham, Ipswich,
June 11th, 1855. CHAS. POPPY.

HAY-MAKING.

Making hay is an operation simple enough in itself, provided the weather be all that is required, but is variously performed, according to the different means taken against unfavourable weather, and the customs of particular localities. Thus, in some places we may see the grass shaken out immediately after the scythe; in others, left in the swathe till the upper side is dried and browned. In one county, foot-cocks are the fashion; in another, the windrows are collected into heaps of great size; and while in one district forks, in another rakes, in a third the naked unarmed hands of the workpeople are chiefly used in tossing and turning the hay.

Common methods being so well known, we may on this occasion allude to one or two processes adapted, perhaps, to certain localities, and which farmers may try, if they think well, in unusual cases of crop or season.

The first is a mode of curing clover hay, called "tippling," the description of which we take from an account of an early reclamation of moss-land near Manchester.

The men and women employed, soon after the clover is cut down and a little dried, take up in their hands a sufficient quantity of the clover to form a loose sheaf in the shape of a cone, the base of which may be about ten inches, and its height eighteen inches; they bind it about the middle with a few long stalks, and from the top another string of clover is drawn out with the finger and thumb, to bind it at the top. These sheaves are then set in rows, in regular order, and remain till sufficiently dry to take into the barn or stack. If the weather proves very wet, the lines of sheaves are removed, and before being carted, are laid on one side, to let the air pass through them. By this method, all the leaves and flowers of the plant are preserved, instead of being left (according to the common management) for the most part in the field. The sheaves have been known to stand several weeks' rain without suffering much deterioration in quality. Tippling has been successfully practised by many farmers, producing a first-class quality of hay, and costing about 5s. per acre. A very similar practice obtains in the North Riding of Yorkshire. Grass seeds are allowed to lie in the swathe for some three or four days, as the sun is scorching or otherwise; that which has fallen between the rows is raked up, and the process of making begins. So soon as the surface is dry, a portion (about a yard in length) of the swathe is taken, and the surface folded inwards, and the whole rolled into a kind of cone. A piece of rye-grass is pulled out of the top, and tied round the head of the "ruckle," as it is called, and the ruckles are set in rows to admit of being easily carted. Thus, while the sun and air thoroughly dry the entire mass, the rain, should it come, descends over the inclined surface of the cone; and as the large mass of leaves which the clover possesses renders it peculiarly liable to injury from wet, this process is most valuable, and in few places is it secured in better order. In a dry time it is carted directly from the ruckles to the stack; in a damp season these are sometimes put into heaps of two or three cart-loads each, in which the hay ferments for a week or two before being carried to the rick.

The next method we shall describe may be pronounced slow and safe, though widely different from the commonly-approved system of tedding out with machines immediately after a large gang of mowmen. The farmer who originated it proceeded upon the principle that the best way of saving hay in *wet* weather is to avoid cutting the grass except in a *dry* state, as well from dew as rain, and to cock it directly after being cut—neither shaking it out, nor letting it lie in the unbroken swathe. He tried it upon many acres of upland hay with good success; and though it may not answer in all situations, or in seasons of unexampled down-fall, the plan is worth the attention of

farmers when the scarcity and value of good hay are so greatly felt.

The mowmen began their work only when the grass was free from all perceptible moisture, which was generally about nine o'clock in the morning. After they had cut about a rood each, other hands were set to cock the hay after them, putting it into heaps about three feet high, and drawing some of the longest grass to lay upon them, by way of thatch, hanging downwards. When a shower fell, the scythes were instantly stayed, and not suffered to re-commence until the grass had again dried. When the weather cleared, either with breezes or sunshine, the cocks were opened, and at night made up again on fresh ground. So the work proceeded, cutting, cocking, and opening the cocks when the weather was fair; but when the clouds were threatening, air was let into the cocks by men raising them to the wind with forks. A great deal of time is taken up by this plan, but the quality of the hay is said to be far superior to that of hay made in the common manner. If care be taken to let air into the small heaps daily, the colour and fragrance of the grass are well preserved; and when we remember how much damage hay sustains from frequent showers of rain, especially when nearly made, we need not be surprised that grass thus dried as it were *in the shade* should be preferable to such as has not been fortunate enough to be made "while the sun shines."

We may add that the mode of hay-making will always be influenced by the character of the climate under which it is practised; and it will not do, therefore, for the ready and skilful hay-makers of Middlesex to ridicule those of the more rainy west and north. Take the county of Northumberland, where they are not considered to be good managers of the operation: they know as well as the southerners that meadow hay cannot be tossed about too much, or made too quickly; but with new-land hay, this would be to shake out the rye-grass seed, and break off and waste the clover leaves, which are the most valuable and nutritious parts of it. It is therefore turned in the swathe entire, from time to time, so as to spread it as little as possible; and it is then got quickly into large cocks, and then into "pikes," or miniature ricks, containing half a ton to a ton, so as to stand two or three weeks before being carted and put into large stacks. Amateur hay-makers may condemn this, but it is the safest plan in a climate so variable as that of Northumberland, and where the hoeing of turnips at the same season requires so much attention. The whole of the hay intended to be put in a stack cannot be got ready in one day; it is safe, therefore, to draw into large heaps that which *is* made, that it may stand free from danger till the remainder be made too, so that all expedition may be used in finishing the stack when once begun. If large cocks are well put up, and in right form, it requires an excessive rain to penetrate more than an inch or two, which is not descernible in the bulk when taken down, and the hay thus managed is less apt to heat too much in the stack.

We are far from denying the correctness of the observation that hay-making is more carefully performed in the south than in the north, but at the same time believe that a great cause of the difference may be found in the variations in climate, which render necessary different modifications of practice in different situations.

SUMMER.

BY ALFRED P. KEYES.

Summer, bright Summer, we greet thee again!
With gladness we hail thy return!
Rich gifts thou wilt scatter o'er valley and plain,
Long buried in winter's cold urn.

Yes, Summer, gay Summer, we hail with delight
The pleasures thou'lt ever bestow;
Thy beautiful scenery will gladden our sight,
And cheer us wherever we go.

The flowerets will blossom in beauty around,
Their fragrance perfuming the air,
Each hill-side and meadow with garlands be crowned,
That monarchs might covet to wear.

The birds, gaily singing in forest and dell,
A charm to the prospect impart;
Their sweet, gleeful music our sorrows dispel,
And lighten from sadness the heart.

The murmuring streamlet will journey along
Through broad, vernal meadow and glade,
In harmony chanting their low, plaintive song,
And sparkle in sunshine and shade.

And mild-scented breezes will soothingly sigh,
Soft breathing the odours of flowers,
Inviting the weary their tasks to lay by,
And repose in the cool, leafy bowers.

And thus when all nature, in gayest attire,
Shall surfeit with beauty our gaze,
Let our thoughts turn from earth, and to heaven aspire,
And join in the concert of praise.

—*New England Farmer.*

PASSENGER PIGEONS.—The number of pigeons to be met with in some parts of America is almost incredible, and the quantity of food daily consumed by them is prodigious. M. Audubon, the celebrated naturalist, makes the following curious estimate respecting them:—"Let us take a column of one mile in breadth, which is far below the average size, and suppose it passing over us without interruption for three hours, at the rate of one mile in a minute. This will give us a parallelogram of 180 miles by 1, covering 180 square miles. Allowing two pigeons to the square yard, we have 1,115,136,000. As every pigeon daily consumes fully half a pint of food, the quantity necessary for supplying this vast multitude must be 8,712,000 bushels per day."

THE PARIS AGRICULTURAL SHOW.

It was our lot within these last few days only, in the course of one of those visits to local meetings which it is not merely our business, but our pleasure to make, to hear that the Agricultural Press of this country had not of late done its duty. In point of fact, it had not given "the true character" of the Paris Agricultural Exhibition. From what we have since learnt, we are inclined to believe that the *Mark Lane Express* was here especially referred to. Taking our choice of the two, as we have already said, we judged that the West of England Show was of more importance to the English agriculturist than that at Paris. We think so still. We are quite ready to allow that those British yeomen who *did* go to France were fêted and complimented and distinguished, as no doubt they ought to have been. Paris is the very city of compliment. Hard as it may be, we have to look at things in a more sober view. Whatever has been the personal gratification of some of our friends, as honest journalists we can be influenced by no such feeling. We maintained, when first writing an introduction to this Paris meeting, that it had commanded anything but a general interest. We wrote this as "the true character" of the meeting. Emphatically we repeat it here. If the Emperor had bestowed the Legion of Honour on Jonas Webb or Brandreth Gibbs, we trust we should have been able to appreciate the compliment. As yet, however, we say again, the results are to come. Either with Englishmen or Frenchmen, the Paris Agricultural Exhibition has commanded anything but a general interest. We record this as "the true character" of the meeting. Happily, we can have only to deal in general results. We have to tell the farmers of this country what they have gained, or what they have lost. The Cattle Show has been followed by one of Implements. The *North British Agriculturist*, which has still its "own correspondent" on the scene—a gentleman of whom we have not the slightest knowledge—thus very honestly reports "the true character" of what he is engaged upon:—

"What excited most surprise to English visitors was the almost total absence of proprietors, farmers, and sightseers generally. At no time were there in the field more than two hundred persons—part of these labourers. An occasional carter, in passing along the great highway which bounded the field, stopped his horses and entered the field; but it did not appear that even the neighbouring proprietors or farmers thought it for their interest to be present. One or two of these classes were present, but they appeared to take little interest in the trial. A few females, with children of the rural labouring classes, were present, and seemed to be pleased with the scene. The absence of those who might have been impelled even by curiosity is a phenomenon in French agriculture, which does not argue well for the rapid progress of improvement, even in the adoption of improved implements."

We need do no more than let this speak for itself.

TRIAL OF AGRICULTURAL IMPLEMENTS AT THE PARIS EXHIBITION.

The trial of ploughs, &c., took place on the 7th June, on the farm of Trappes. The situation selected was distant from Paris about 25 miles, and was reached by the line of the Western Railway; station, Trappes. The trial having been originally fixed for Thursday, the 5th, on the morning of that day a considerable number of persons were collected; these principally from Paris, by the train which left at 7.25. When the party reached the station at Trappes, they were informed that none of the implements had arrived; that they might have been left at Versailles, but as there was no communication by the line of wires, it was impossible to telegraph for information. After a considerable expenditure of words, the most of the party walked to the farm of Trappes, looked over the stock, farm buildings, &c., and afterwards walked through the farm. The farm of Trappes consists of 770 acres, in the occupation of the proprietor, M. Dailly. M. Dailly is Maître de Poste à Paris, and has a very large establishment of horses. The herd of cows (of the Norman breed) were large handsome animals, and beautifully kept. The court was also in a state of tidiness such as is seldom to be witnessed. The condition of the farm as to cleanliness, with the luxuriant crops of wheat and lucerne, gave great satisfaction to the strangers. The company were afterwards invited to breakfast. After a most sumptuous repast was partaken of, the party left for Paris by the mid-day train from Trappes, being much pleased with M. Dailly's hospitality, although still somewhat out of humour with the Commissioners of the Exhibition.

On Saturday morning many of the same gentlemen who had been disappointed on Thursday were at the station for the first train, but most of the amateurs were absent. As the party reached the station of Trappes some misgiving as to the trial coming off was expressed. After the field was reached by ominibuses and other vehicles provided by M. Dailly, there were indications that the trial would take place. The ground selected was a portion of a field from which was being cut a heavy crop of tares, part of which, placed in hecks, was being eaten by sheep, these confined in hurdles during the day to manure the land, and, strange enough, kept without food. The soil is a light loam, naturally of easy draught. The extent of ground for trial did not exceed five acres, and surprise was expressed at the limited area of space, and the arrangements which were made for testing the various implements. The length of the field was about 240 yards. Ploughs to the

number of 40 were present, but only part of them were submitted to trial, a "selection" being made.

Count Gasperin, President of the Commission for agricultural implements, and Mr. Denison, Sub-President, directed the proceedings, assisted by the judges, M. Mole, Professor of Agriculture, Paris; M. Evart, Inspector-General of Agriculture; M. Barral, Editor of the *Journal d' Agriculture;* M. Dailly; and Mr. Amos, London, Consulting Engineer to the English Agricultural Society. Mr. Appold, inventor of the centrifugal pump, and Mr. E. Combas, C.E., Paris, assisted.

Only one plough was yoked at a time; latterly, as the day advanced, two or three were at work. Each of the ploughs which were tested by the dynamometer made two rounds, one to clear out a furrow corresponding to the form of furrow-slice made by the plough, the second furrow to test the weight of the plough by the dynamometer. The dynamometer used was Bentall's. Other two were tried, but none of them wrought well. One gave way after going nearly a round of the plough. The management of the dynamometer was entrusted to Mr. Amos and Mr. Appold.

The depth of the furrow varied from six to seven inches, breadth from eight to ten inches. The cutting and turning of the furrow-slice were indifferently executed by nearly all of the German ploughs. The French ploughs did not make a favourable position for themselves, with the exception of one from Grignon. The Belgium ploughs were generally esteemed by the company. The work was, however, only indifferently executed, according to English ideas, the furrow not being well turned over or loosened in the bottom. In a very light soil they would prove serviceable ploughs, but even in weight of draught they occupied a less favourable place than most of the English ploughs. All of these made a most favourable impression on the company, Howard's occupying the first place. The dynamometer placed this plough first. As to weight of draught, it was much lower than at any previous trial made. The Canadian ploughs made excellent work, but partly from the mould-board of one not being clear, and partly from their irons not being well adjusted, their weight of draught was above that of the English ploughs.

The following ploughs were tested with the dynamometer:—

No. 1, from the Duchy of Baden. Depth of furrow 7 inches, breadth 10 inches, work indifferent, weight heavy.

No. 2. Busby, English. Depth of furrow 7 inches, breadth 10 inches, work very superior, weight considerable. Sand somewhat hard and lumpy, compared to that turned over by the other English ploughs.

No. 3, from Prague. Depth of furrow 7 inches, breadth 10 inches, work very superior; the weight much above the average of other ploughs. This plough, stated to be constructed on geometrical principles, excited a good deal of interest previous to the trial. The practical testing of it dispelled all feeling in its favour. The gentlemen having charge of it, M. F. Horskny, Bohemia, not being satisfied with the first trial, a second placed it lower in the scale. This result is an almost universal one, when science attempts to construct any machine without the aid of practical knowledge.

No. 4, from Belgium. Depth of furrow 7 inches, breadth 9 inches, weight medium. The furrow slice was broken up in lumps, and these thrown somewhat forward. As a seed furrow it was, therefore, very objectionable.

No. 5. *Bree* plough; maker, Seloup. A provincial plough of a large grain-growing county near Paris—depth 4½ inches, breadth 11 inches, weight heavy. Furrow placed partly on edge.

No. 6. Canadian, Toronto. Depth 8 inches, width 11 inches, weight under the average; work beautifully executed, according to the common idea of practical men in Scotland.

No. 7. Grignon. Depth 6½ inches, breadth 9 inches. The lighest in draught of all the ploughs tested, with the exception of two English ploughs.

No. 8. From Belgium; maker, Joseph Tixon. Depth of furrow 7½ inches, breadth 10 inches. Light of draught, furrow slice loose and broken, and placed somewhat on edge.

No. 9. Howard (English). Depth 7 inches, breadth 9½ inches. The lightest of all the ploughs. The work executed in the most perfect manner, according to English ideas of ploughing. The plough went a round without being held by the ploughmen, and ploughing well performed.

No. 10. From Parage; maker, R. Jasher. Depth 6½ inches, width 10 inches. Weight above the average. Work not well, executed, the furrow slice being turned forward, the mould-board not clearing itself.

No. 11. Ball (English). Depth 8 inches, width 10 inches In weight next to Howard's plough. The execution admirable, and divided opinion with Howard's plough.

No. 12. Saxony; maker, Thaer. Depth 7½ inches, breadth 9¾ inches. Weight much above an average; the plough rather pushing the furrow than turning it over.

No. 13. Ransome and May (English). Depth 7½ inches, breadth 9½ inches. Weight about an average. Work very well done. This plough was purchased by M. Bello, of Grignon.

No. 14. From Belgium, maker, Odiers. Depth 6½ inches breadth 11 inches, weight above the average. Work well, executed. This plough was with French and English gentlemen present a favourite; stated to be generally used in Belgium and some parts of France.

No. 15. Canada West. Depth 8 inches, width 10 inches, weight above an average. The mould-board was not clear. This increased the draught, and injured the appearance of the work.

There were several other trials of implements made during the day. One plough from Tuscany appeared to be the highest draught; it would require some 6 strong oxen to drag it through stiffish soils, or even soils of medium tenacity. The weight of this plough, along with one or two others, was more than quadruple that of Howard's plough, thus placing the labour of eight oxen in the same position, as to results, to that of two oxen.

Of subsoil ploughs, there was tried one from the south of France, on the principle of a digging machine; circular teeth, fixed into an axle, dug into the subsoil. Upon examining the work, it was found that it left blanks about the size of bricks, and these, although sometimes moved, were generally firm; thus, on stiff wet soils, these hollows, by forming a receptacle for holding water, would tend to injure the crops. Another subsoil implement, from Grignon, performed its work better. It was a large grubber, foot fixed into a beam, and moved as a common plough. Another one of iron, with two wheels in front, moved the soil much in the same manner as that from Grignon.

A ribbing machine formed of three ploughshares fixed together, and thus form three ruts at a time for seed, &c. The form is not new, it having been often exhibited in the United Kingdom. A hay tedding machine was tried on a field of lucerne, but the operation was not satisfactory; lucerne being one of the forage plants which should be handled, when being made into hay, with the greatest care, so as to retain the

leaves, which are very liable to separate from the stalks when roughly moved. The drill and hoeing machines present were not tried.

What excited most surprise to English visitors was the almost total absence of proprietors, farmers, and sightseers generally. At no time were there in the field more than two hundred persons—part of these labourers. An occasional carter, in passing along the great highway which bounded the field, stopped his horses and entered the field; but it did not appear that even the neighbouring proprietors or farmers thought it for their interest to be present. One or two of these classes were present, but they appeared to take little interest in the trial. A few females, with children of the rural labouring classes, were present, and seemed to be pleased with the scene. The absence of those who might have been impelled even by curiosity is a phenomenon in French agriculture, which does not argue well for the rapid progress of improvement, even in the adoption of improved implements.

By this time it struck seven o'clock, and trials were closed. The company was invited to dinner. As they had already partaken of M. Dailly's hospitality that morning or on Thursday, most of them would have preferred getting on to Paris, but as there was no train till half-past nine, they accepted of the invitation, to the number of 60 or 80. After a most splendid service, several speeches were delivered. M. Dailly proposed the progress of agriculture, with the health of those strangers present, and alluded in flattering terms to the position of English and Scottish agriculture. Mr. Denison returned thanks for the United Kingdom, and Mr. Perry for Canada. M. Wells proposed the health of Count Gasperin. This was received with three cheers, given in true British style. M. Barral spoke in still more flattering terms of the agriculture of England and Scotland than had been done by M. Dailly, and stated that, while they were in advance in practice, and were setting example to the whole world in cultivating the soil, they were in agricultural implements unequalled by any other country. They had often heard in France of this superiority; they had this day witnessed it; and they now felt convinced that in the production of agricultural implements, and in the management of these, they excelled.

The time of the trains having now arrived, the party took leave of their host with feelings of respect for his politeness and hospitality.

The assiduous attention which the judges bestowed on their duties was generally remarked, and the amount of personal fatigue which they underwent under a bright sun and a high range of temperature was what few would have undergone, if they had not been influenced by the highest motive—that of a sense of duty.—*North British Agriculturist.*

THE WHEAT TRADE.—No. 4.

Sir,—Notwithstanding your professed inability to follow C.S. (query S.C.) in his farsighted view into the future of the wheat trade,* I flatter myself I have not gone beyond the sphere of probability, into the regions of infinite space; and to prove this, I now propose to "follow myself," as Paddy would say, by backing up my opinion with further investigation, and showing why it is that I do not look for any reduction in prices next season, but rather, under certain circumstances, enhanced rates for wheat, although, I trust, not famine ones. I am not disposed to croak or exaggerate; and I shall be very thankful if you or any of your correspondents, more *au fait* on the subject than myself, will be good enough to point out any error you or they may perceive, when I have stated my case.

Commencing at the opening of the agricultural season, which I assume to be the beginning of September, I find that last year, by general consent, although the stock of native wheat had been reduced to the extent of five million quarters, to meet the deficiency of the crop of 1853, there was an excess in the new crop beyond the usual average, amounting to fully the quantity thus consumed. But even with this surplus of production, the crop was not more than what the year's consumption required, namely, twenty-one million quarters; so that we still wanted an importation of five million quarters to reinstate the reduced stock, and place us in what may be considered a merely safe condition, that we might be prepared for whatever adverse contingencies might turn up.

In spite, however, of the largest crop of wheat which was ever grown in the United Kingdom, we have had (with the exception of two or three weeks at the first of the season) a continuation of the highest prices of the previous year, (one of acknowledged deficiency to a large extent,) without any considerable fluctuation to indicate that it was otherwise than the natural operation of trade, regulated by the common conditions of demand and supply. And what were the circumstances which have caused the price of wheat to rule so high, during a season of unexampled abundance, so far as the crop was concerned? Simply, 1st, the impossibility of supplying by importation the deficit created in the stock the previous year; 2nd, the conviction that without it, we should barely have enough to carry us through the season; 3rd, the high price of wheat in France, and other parts of the continent of Europe (to say nothing of America), in consequence of the exhaustion of the stocks the previous year, and the deficiency in the crops of the last year. Under the operation of these causes, we have been restricted in our importations to such an extent, that instead of five, we shall probably be unable to obtain more than two-and-a-half million quarters by the 5th September, which will be all the stock of old wheat, whether native or foreign, we shall have to commence with, the next season. Now, let us see how this will operate upon the wheat trade throughout the coming year.

I am fully of your opinion, that we shall have an average produce reaped at the coming harvest, say sixteen million quarters (but not above that), provided the crop sustains no further injury. I do not expect we shall have above that quantity, which will render an

* See *M. L. E.* Review of the Corn Trade, June 18.

importation of five millions necessary to make up the year's consumption of the kingdom. I have already, in my letter of the 1st June, made an estimate of the sources from whence this quantity may be obtained. That estimate, however, was an extreme one, depending wholly upon the universal goodness or productiveness of the crops abroad; and should any calamity happen in that direction, it would, of course go for nothing. But even if we were to import to the extent of five million quarters, we should still be minus three millions in stock, which hitherto we have been unable to replace this season, and which there is no probability of our being able to do in the next.

Until, therefore, the termination of the war shall have placed at our disposal the stores of wheat in Southern and Eastern Russia and the Danubian principalities (which I much fear is far from being likely at present), we shall have to depend chiefly on our own native growth of wheat, which we know to be inadequate, with such additional supplies as the exigencies of our neighbours can spare for us; and whilst this state of things continues, I see no probability, with such an instance as that of the past season before us, of any reduction in price.

I do not know whether we ought wholly to shut our eyes to the possibility of a partial failure of the growing crop, or the contingency of a wet harvest, which would be the same in effect. The harvest will certainly be both a late and a protracted one, the latter from the shortening of the days; and generally speaking, a protracted harvest is a precarious one. Should anything occur to damp our prospect, and reduce our produce of wheat below an average, what then would be the consequence? Probably, as in 1801*, our Government would be driven to make peace with Russia, by the fear of those popular commotions which an extreme high price of the first necessaries of life, commonly produce.

With such a possibility before us, and the certainty that we shall require, under any circumstances, more wheat, to place ourselves in a safe condition, than we can obtain, I do hope that our merchants will this year bestir themselves in time, and make arrangements for obtaining supplies, before France and other countries snatch them from them, as in the autumn of 1853: that year they lost the opportunity of purchasing, *by sending out orders with a maximum price*; whilst the French Government sent agents with orders to purchase at the market price; consequently, when the English order arrived, their price was far below the current one, and the opportunity of purchasing was lost.

Let our merchants then profit by their former failure in this respect; for assuredly we shall want all the wheat we can obtain next season, let the result of the coming harvest be ever so favourable. There is no stock in the hands of any one class of persons who trade in wheat or flour, except the farmer; and after almost exclusively supplying the market for ten months of the year, we cannot believe that there is more in his hands than will suffice to complete the year's consumption; and we shall consequently have to begin upon the new crop at once.

Yours, truly,

June 27. S. C.

* In consequence of the extravagant high price of bread at that period, and the bread riots which took place, the question of peace was warmly debated in the Cabinet, the majority of which was in favour of it; but the King, George the Third, strenuously opposed it. Addington, the then Premier, getting rather warm at this opposition, rose and *said emphatically*, "*Please your Majesty*, the people require peace, they demand peace, and they must have a peace." The King rose in a paroxysm of anger he not unfrequently exhibited when opposed, and which was a symptom of his incipient madness, and exclaimed with violence, "Hear, my Lords and Gentlemen; hear! Addington's a Jacobin! Addington's a Jacobin! he advocates peace!" &c. Peace, however, although of short duration, was the result.

A FACT IN MANURING.—A person carrying some orange trees from China to the Prince of Wales' Island, when they had many hundred fruit on them, expected a good crop the next year, but was utterly disappointed: they produced but few. A Chinese, settled in the island, told him if he would have his trees bear, he must treat them as they were accustomed to in China; and he described the following process for providing manure:—"A cistern, so lined and covered as to be air-tight, is half-filled with animal matter; and to prevent bursting from the generation of air, a valve is fixed, which gives way with some difficulty, and lets no more gas escape than is necessary: the longer the manure is kept the better till four years, when it is in perfection; it is taken out in the consistence nearly of jelly, and a small portion buried at the root of every orange tree—the result being an uncommonly great yield." A person hearing of the above fact, and wishing to abridge the term of the preparation, thought that boiling animals to a jelly might have a similar if not so strong an effect. Accordingly, he boiled several puppies, and applied the jelly to the roots of a sterile fig-tree: the benefit was very great—the tree from that time for several years bearing in profusion. Hints of this kind are well worth preserving, for though an English farmer may neither have the apparatus of the Chinese, nor puppies enough to become an object of attention, yet the reduction of manure to a mucilaginous state ought perhaps to be carried further than it is.

HOW TO BOIL MEAT.—Large joints of meat should be neatly trimmed, washed extremely clean, and skewered or bound firmly into good shape, when they are of a nature to require it; then well covered with cold water, brought to boil over a moderate fire, and simmered until they are done, the scum being carefully and entirely cleared from the surface of the water, as it gathers there, which will be principally from within a few minutes of its beginning to boil, and during a few minutes afterwards. If not thoroughly skimmed off at the proper time, it will sink, and adhere to the joint, giving it a very uninviting appearance. We cannot too strongly again impress upon the cook the advantages of gentle simmering over the usual fast boiling of meat, by which the outside is hardened and deprived of its juices, before the inside is half done, while the starting of the flesh from the bones, which it occasions, and the altogether ragged aspect which it gives, are most unsightly. Pickled or salted meat requires longer boiling than fresh; and that which is smoked and dried longer still. This last should always be slowly heated, and if, from any circumstances, time cannot have been allowed for soaking it properly and there is a probability of its being too salt when served, it should be brought very softly to boil in a large quantity of water, which should in part be changed as soon as it becomes quite briny, for as much more that is ready boiling. It is customary to lay large joints upon a fish plate, or to throw some wooden skewers under them to prevent their sticking to the vessel in which they are cooked; and it is as well to take the precaution, though unless they be placed over a very fierce fire they cannot be in danger of this. The time allowed for them is about the same as for roasting, from 15 to 20 minutes to the pound.—*Miss Acton's Modern Cookery.*

THE LATE PHILIP PUSEY, ESQ.

Amongst the many good men who have made for themselves a name and reputation in the pursuits of agriculture, none can be mentioned with more deserved distinction than Mr. Philip Pusey. The Royal Agricultural Society of England may be almost said to stand as a monument to his fame; for, as in every associated body of men there is sure to be some especial guiding spirit, so has his influence happily been acknowledged here. He was, too, singularly well qualified for the labour of love upon which he was so long and so well engaged. His position as a country gentleman, his great abilities, natural tastes, and amiable disposition, all combined in a very remarkable degree to fit him for the duties he undertook. Of what he achieved the Journal of the Society is, perhaps, the best, as it is the most direct evidence. Under his care it has grown to what it is. Little conscious of how soon they were to be deprived of his aid, the present conductors of this work becomingly speak to the character of their predecessor in the number now just issued:—"This being the first number of the Journal which has not had the benefit of Mr. Pusey's active superintendence, the Journal Committee cannot send it forth without expressing their deep regret at the severe and protracted illness which still deprives them of his valuable assistance. They are also desirous of recording their high sense of the important services which, in his threefold capacity of chairman of the committee, editor, and author, he has conferred upon the Society and the country at large. From the very commencement of the Society, the labours of the other members of the committee have been comparatively light; and it is right that the members of the Society should know to whom they are chiefly indebted for the success which has been achieved, for the reputation which the Society's publications enjoy in this and other countries."

This is very true; but even this is not all. So long as Mr. Pusey was a member of the House of Commons, so long was he the representative of the tenant farmers of this country. It will stand well to his credit, and answer many an argument which ignorance or selfishness may have prompted, that Philip Pusey, the leading man of the great agricultural association of this country, was the unwavering champion of the TENANT RIGHT principle. From the first moment he recognized its effects, from that moment did he continue firm to its advocacy. No matter how little he prevailed in "the house"—no matter how much prejudice or something worse may have there told against him, it is satisfactory to feel that by the country his efforts *have* been appreciated. Few now, word it as they will, dare to question the justice of the English tenant's right. When they would confound it with the extravagances of the Irish claim, they condemn themselves: when they refuse it to their own fellows, their plea is but equally "guilty." Philip Pusey, *the* farmer's friend of his age, has in his experience but confirmed that which the *Mark Lane Express* has so unceasingly supported. In our regret at his decease we have something more than a common sympathy. Mr. Pusey, with all the advantages education and practical knowledge could afford him, dared as a landlord to plead the tenant's *right*. His cause became so doubly armed—his cause is ours. May those who follow him prove worthy of him!

PHILIP PUSEY, ESQ.—On Tuesday, July 9, Philip Pusey, Esq., of Pusey-park, Faringdon, Berks, died at the residence of his brother, the Rev. Dr. Pusey, at Christ Church, in Oxford University. The deceased was seized with a paralytic stroke in November last, while staying with his brother, and was unable to be removed. From that time his health had been gradually declining, but it was only within the last day or two that he exhibited symptoms of sinking. He has been under the treatment of Dr. Acland, who was with him at the time of his death, which took place about two o'clock in the afternoon. The deceased was the eldest son of the Hon. Philip Bouverie, who assumed the surname of Pusey, half-brother to the first Earl of Radnor. He succeeded to the estates on the death of his father in 1828, was born June 25, 1799, and married October 4, 1822, Lady Emily Frances Theresa Herbert, second daughter of the late Earl of Carnarvon, by whom he had issue Edith Lucy Bouverie, born 15th June, 1851. Mr. Pusey entered Parliament in 1830 as member for Chippenham; in 1831 he represented Cashel. He contested the county of Berks in 1832, but succeeded in 1835, and retained his seat until the general election in 1852, when, being threatened with an opposition, he retired, and Mr. G. H. Vansittart was elected in his place. Mr. Pusey was distinguished as an agriculturist, and was the President of the Royal Agricultural Society of England last year; but, owing to indisposition, was unable to preside at the meeting at Lincoln, and the Earl of Chichester officiated in his absence. He edited the journals of the society, and was one of its chief contributors. He was equally eminent as a practical agriculturist, and gave every encouragement to new implements and manures, and was a great advocate for combining practice with science. He was universally beloved, for there was a natural frankness and warm-heartedness with him that developed themselves in every relation of life; and among his tenantry it was impossible for any one to be more highly esteemed. Since his connection as a member for the county

of Berks closed, he appeared to have lost many of his old associations, and was no longer mixed up with those with whom he had taken an active public part in relation to agricultural matters, and it has been thought by some that he felt this separation very deeply, and that it affected his health and shook his constitution. The Puseys are said to have been settled at Pusey prior to the Conquest, and to have held that estate by cornage or the service of a horn, under a grant of Canute. Camden and Fuller mention this circumstance. The horn is still preserved at Pusey, and is a great curiosity.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held on the 27th of June. Present: Mr. Miles, M.P., President, in the Chair; Lord Berners, Lord Bridport, Hon. A. Leslie Melville, Hon. W. H. Yelverton, Sir Montague Cholmeley, Bart.; Sir Robert Price, Bart., M.P.; Mr. Raymond Barker, Dr. Calvert, Colonel Challoner, Mr. Collingwood, Mr. Deere, Mr. Garrett, Mr. Glegg, Mr. Gray, Mr. Fisher Hobbs, Mr. Kinder, Rev. H. Knatchbull, Mr. Majendie, Mr. Maning, Mr. Paine, Mr. Parkins, Prof. Simonds, Mr. Thomas, Mr. Burch Western, and Mr. Wilson, of Stowlangtoft.

Russian Cattle-Disease.—Lord Berners stated to the Council at their previous week's meeting that he had seen a notice in the "Press" of that week, of a cattle-pest in Russia of so virulent a character that the Prussian Government had interdicted the importation of cattle, hides, fat, wool, hair, and even of herdsmen, from that empire into the Prussian dominions. Lord Berners had on the previous evening named this report to the Earl of Clarendon in the House of Lords, when his Lordship at once expressed his willingness to render every service in his power in reference to a subject of so much importance to the agricultural interest of this country, and stated his intention of at once instituting the requisite inquiries by despatches to be conveyed on the following morning by a special messenger to Berlin. The Earl of Clarendon requested Lord Berners to assure the Council of the Royal Agricultural Society of England, that on this subject, and on all others which came within the control of his department at the Foreign-office, it would at all times give him the greatest satisfaction to receive and endeavour to carry out their wishes. The following communications have already been made to the Council in reference to this cattle-plague.

"Lord Wodehouse presents his compliments to the Secretary to the Royal Agricultural Society of England, and is directed by the Earl of Clarendon to acquaint him, for the information of the President and Trustees, that his lordship's attention having on Tuesday last been called by Lord Berners to an article in the *Press*, stating that the cattle plague had broken out in Russia, and that severe precautionary measures had in consequence been taken in Prussia, he instructed her Majesty's Minister at Berlin to inquire and report upon the subject. Lord Bloomfield states in reply by the telegraph that Baron Manteuffel, the Prussian minister of state, expressed his belief that measures of precaution against infected cattle had been taken by local Prussian authorities on the Russian frontier, but his Excellency was not informed as to details and would make inquiry.

"Foreign Office, June 22, 1855."

"Foreign Office, June 26, 1855.

"Sir,—With reference to my note of the 22d inst., I am directed by the Earl of Clarendon to transmit to you, for the information of the President and Trustees of the Royal Agricultural Society, copy of a despatch from her Majesty's Minister at Berlin, containing information relative to the precautionary measures established in Prussia in consequence of the malady lately broken out in that country amongst the cattle.

"I am, Sir, your most obedient humble servant,

"Wodehouse.

"The Secretary to the Royal Agricultural Society."

(Copy).

"Berlin, June 23, 1855.

"My Lord,—In consequence of the prevalence of disease among cattle in Russia and Poland, the Prussian local authorities on that frontier have felt themselves called upon to put in vigour certain precautionary measures to prevent the spread of this malady, which they are authorized to do by the Prussian law of March 27, 1836, of which I inclose to your lordship herewith a copy in original, with a translation of the 3d article, which empowers the local provincial authorities, in cases where the disease may appear within three miles or less of the frontier, to prohibit the importation of all species of horned cattle, as well as of any articles likely to carry infection, and I am informed that this measure has been lately resorted to by the Prussian local authorities on the whole line of the frontier. I understand from Baron Manteuffel that no case of disease has yet made its appearance in this country.

"I have, &c.,

"To the Earl of Clarendon." (Signed) "Bloomfield.

(Copy).

"The above measures are to be more strictly observed if the murrain has broken out in the vicinity of the frontiers. If an infected place in a foreign country is only three miles or less from the frontier, then it is positively forbidden along a certain extent of frontier, to be marked out by the provincial authorities, and in any case along the extent that lies so near to the place infected, to admit—

(*a*) Horned cattle, sheep, swine, goats, dogs and poultry, fresh skins of bullocks and of other animals, horns, and unmelted tallow, beef, dung, winter fodder, and stable implements of any kind.

(*b*) Also raw wool, dry hides, and the hair of animals (bristles excepted) are excluded, if there is reason to believe that they come from an infected place.

(*c*) Only to allow such persons to pass without molestation who, according to their circumstances, cannot be supposed either to have been in any infected place at all, or, even if they have been there, in any way to have come in immediate contact with infected cattle. All persons, on the contrary, who, according to their circumstances, may be supposed to be occupied and to have intercourse with cattle, such as cattle and leather dealers, butchers, tanners, skinners, are refused admission; or they must, when very cogent reasons are brought forward for their admission, previously submit to a careful purification, to

take place under the superintendence of the police. The provincial authorities are moreover empowered to enforce the application of these measures, even when the infected places lie *five* miles beyond the frontiers.

"This must, in every case, happen when a brisk and accelerated trade in the above-named articles takes place by means of turnpike roads or communication by water between the infected places and the inland, or when the contagion in the interior of the foreign country has spread itself to a great extent. In cases of this kind, and especially when the spreading of the contagion in the foreign country propagation makes rapid progress, or when other dangerous circumstances happen, then these measures are to be enforced, even when the disease prevails at a distance of more than five miles."

The Council expressed their deep sense of Lord Clarendon's warm and effective interest in promoting the objects of the Society, and the welfare of the agricultural community.

Butter Production.—Mr. Horsfall communicated the following statement in reference to the amount of butter obtained in his dairy :—

"Burley Hall, June 21.

"On perusing Mr. Scott's paper, I find he states that a milk cow, on the average (we must adhere to average and leave out exceptional cases), produces 196lbs. of butter a-year. Dr Muspratt, in his recent publication, states the ordinary yield of butter per year at 160lbs. to 180lbs. in England, and the daily yield of butter from a cow at 8 ozs. to 9 ozs. which on a yield of 8 to 9 quarts of milk show 1 oz. per quart, or 50 per cent. less than what is shown by Mr. Scott's results on 17 experiments. Mr. Rowlandson, and other writers on this subject, give a result similar to that stated by Dr. Muspratt—about 1 oz. to each quart. Mr. Scott, in his paper, states that 10 quarts is not more than an average yield of milk per day for a cow; allowing a cow to be in milk 300 days a year, the annual yield would be per year 3,000 quarts, which I am disposed to think is not more than a moderate average on dairy cows *properly maintained*. My own cows are not allowed to be dry two months a year, and I am satisfied that 3,000 quarts per year is not an over estimate of the average of my dairy cows. Now, on 3,000 quarts, Mr. Scott's average of butter, 196lbs. a year, would reduce his yield of butter in proportion to milk about one-third, or 33⅓ per cent., and leave it very similar to what is stated by Dr. Muspratt and other writers. Mr. Scott had no right to draw the inference that my yield of butter from cream might be attributable to my butter containing a greater quantity of butter-milk, as I sent a sample of butter from a churning which I superintended personally, when five quarts of cream produced 127 oz. of butter, being fully 25 oz. per quart. The analysis of this butter has already been submitted to the Council, and will be found not to contain a less proportion of pure butter than is ordinary; in this respect it is superior to the butter of Mr. Acland, the analysis of which, by Professor Way, I have before referred to. Now, if I deduct the casein or curd from my butter, it will affect the quantity of butter from a quart of cream to the extent only of about half an ounce; or if I deduct the whole extraneous matter, there will still be upwards of 21 oz. of pure butter from a quart of cream. This peculiar richness of my cream is surely of sufficient interest to relieve me from the charge of having unnecessarily obtruded myself on the notice of your Honourable Council. The matter cannot be allowed to rest here: with your permission I shall again recur to the subject, and shall introduce some features of my treatment, which are not noticed by Mr. Scott.—Thomas Horsfall."

Mr. Horsfall having also stated that, "if he could be informed when the subject was likely to be introduced again at the Council meeting, he might possibly attend to give any explanation required, as he felt much interested in the matter;" the Council decided that Mr. Horsfall should be invited to attend their weekly meeting on Wednesday, the 11th of July, at 12 o'clock.

Agricultural Motive Power. — Mr. Garrett informed the Council that an invention of the highest importance to agricultural operations had been made by Messrs. Boydell and Glasier, of Camden Town. A private trial of the invention was to take place on the following day; and the machinery had been entered for trial at the Carlisle meeting. He considered this invention the first virtual step that had been made towards the successful application of steam power to the cultivation of the land; and that if the results anticipated should be realized, it would, in his opinion, constitute one of the greatest discoveries of the day, in the adaptation of steam power to the traction of powerfully resisting obstacles over broken surfaces, uneven roads, or up steep ascents, along which no locomotive steam-engine had hitherto been able to proceed.

A Monthly Council was held on Wednesday, the 4th of July. The following members of Council and Governors of the Society were present: Colonel Challoner, Trustee, in the chair, Sir John Villiers Shelley, Bart., M.P., Sir Stafford Henry Northcote, Bart., M.P., Sir Matthew White Ridley, Bart., Sir Charles Gould Morgan, Bart., Sir Montague John Cholmeley, Bart., Sir Robert Price, Bart., M.P., Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Bramston, M.P., Mr. Bullock, Mr. Cavendish, Mr. Druce, Mr. Foley, M.P., Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Hoskyns, Mr. Kinder, Professor Simonds, Mr. Simpson, Mr. Thompson, Mr. Towneley, Captain Vyner, Mr. Jonas Webb, Mr. Wilson (Stowlangtoft), and Mr. Woodward.

The Earl of Powis, of Powis Castle, Montgomeryshire, and Berkeley-square, London; and the Lord Stafford, of Costessy Park, Norfolk, and Eaton-place, London, were elected Governors of the Society.

The following new Members were also elected :
Armstrong, Robert, Blackhall Hall, Carlisle.
Baldwin, John, Luddington, Stratford-on-Avon.
Davis, Thomas, Sugus Court, Hereford.
Elgin and Kinkardine, the Earl of, Broom Hall, Fifeshire.
Farmer, Archibald Hamilton, Woodstock, Canada (West).
Fulcher, Thomas, Elmham, Norfolk.
Hall, Henry, Alton, Hampshire.
Hamilton, Charles William, Hamwood, Dunboyne, Ireland.
Hookham, Francis, Swallow's Vale Farm, Ulceby, Linc.
Hopkins, Henry, Burnside, Everdale, Van Diemen's Land.
Hubbard, Thomas, Elmham, Norfolk.
Massey, Captain H. H., Hazelhurst, Lymington, Hants.
Morton, Prof., W. I. T., Royal Veterinary College, London.
Noel, Capt. Edward Andrew, Clunna Falls, Alvington, Glouc.
Pedley, John, Wheelock Hall, Sandbach, Cheshire.

Stephens, John, The Grove, Stratford, Essex.
Stephens, William Carr, The Grove, Stratford, Essex.
St. Maur, Lord Archibald Henry Algernon, Burton, Leic.
Tippler, William, jun., Roxwell, Chelmsford, Essex.
Tuxford, Weston, Boston, Lincolnshire.
Tuxford, Joseph Shepherd, Skirbeck, Boston, Linc.
Tuxford, William Wedd, Boston, Lincolnshire.
Wright, Thomas, Harraby, Carlisle.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, submitted the monthly report of the accounts; from which it appeared that the current cash-balance in the hands of the bankers was £2,668.

JOURNAL.—Mr. Thompson, Chairman of the Journal Committee, laid on the table the first number of the Journal for the current year, and reported the following recommendation of the committee, which was adopted by the Council, namely:—"That a sum not exceeding £150 may be expended by the Journal Committee in payments to authors of papers for the Journal during the next twelve months."

CHEMICAL INVESTIGATIONS.—Mr. Thompson then presented the following report from the Chemical Committee, which was also adopted:—

I. That one of the subjects of chemical investigation during the present year be:—
   The Composition of Land-drainage Water.
II. That the subjects of the lectures by the consulting-chemist in the spring of 1856 be:—
   1. The influence of climate on the action of manures.
   2. The evaporation of ammonia from the soil, especially when recently manured.
   3. A review of the progress of chemical science with reference to agriculture at home and abroad.

CARLISLE MEETING.—Mr. Fisher Hobbs, Vice-Chairman of the General Carlisle Committee, reported the completion of the arrangements at Carlisle in reference to the landing of the cattle and implements, and the approaches to the show-yard. He also reported the acceptance of a tender for the Pavilion Dinner, made by Mr. Breach, of the County Hotel at Carlisle.

CHELMSFORD MEETING.—The Council accepted the offer of Mr. Henry Manning, of 251, High Holborn, to undertake such works as the Society may require for its Chelmsford Meeting in 1856, on the same terms as for the Carlisle Meeting this year.

IMPLEMENT JUDGES.—Mr. Fisher Hobbs also reported from the Implement Committee their recommendation of Judges in the Machinery and Implement Department of the Carlisle Show, which recommendation was adopted by the Council.

PARIS SHOW.—Mr. Fisher Hobbs took that opportunity of stating that Mr. Milward having been appointed by the Council at their last monthly meeting the English juror for short-horned and other cattle, and he (Mr. Hobbs) the English juror for sheep and pigs, at the Agricultural Show recently held at Paris, he could not withhold the expression of his admiration at the excellence of that first international gathering of the friends of agriculture from every part of the civilized world, and his conviction that the happiest results would in every point of view result from that meeting, which he believed would form a new era in agricultural progress.

AUTUMN VACATION.—On the motion of Mr. Raymond Barker, seconded by Sir John Villiers Shelley, Bart., M.P., the following resolution was carried unanimously, namely, "That the business of the Society shall be so arranged as to afford the Secretary and Staff their usual vacation between the 20th August and the 20th October."

The Council then adjourned their Country Meeting business to a Special Council to be held at the Guildhall, Carlisle, on Friday in the week of the Show.

LECTURES.—July 11, at Noon, Professor Simonds, "On the Physiological Conditions affecting the quantity and quality of Milk secreted by the Cow under different circumstances of feeding and management." July 18, at Noon, Professor Way, "On the use of Fish as Manure."

RUSSIAN CATTLE-DISEASE.—The Society has been favoured with the following further communications from the Foreign Office:—

Foreign Office, July 6, 1855.

SIR,—With reference to my letter of the 26th ultimo, respecting the precautionary measures adopted by the Prussian authorities on the Polish frontier against the spread of the cattle disease stated to be prevalent in Russia, I am directed by the Earl of Clarendon to transmit to you, to be laid before the president and trustees of the Royal Agricultural Society, a copy of a despatch* from Her Majesty's Minister at Berlin, inclosing a report from the British Vice-Consul at Memel on the same subject.—I am, Sir, your most obedient, humble servant, WODEHOUSE.

The Secretary to the Royal Agricultural Society, &c.

(Copy.)

No. 272.

MY LORD,—With reference to my despatch, No. 246, of 23rd inst., relating to the prohibition of importation of cattle, &c., from Russia across the Prussian frontier, I have the honour to forward to your lordship herewith a copy of a report on this subject from Her Majesty's Vice Consul at Memel, from which your lordship will perceive that there are doubts as to the existence of disease among cattle in the provinces adjacent to the district in which Mr. Hertslet resides, and that other motives may possibly have led interested parties to cause the importation of cattle into Prussia to be forbidden.—I have, &c., (Signed) BLOOMFIELD.

The Earl of Clarendon.

Extract from Mr. Vice-Consul Hertslet to Lord Bloomfield, dated

Memel, June 27, 1855.

The export of cattle from Russia meets with no obstacles from the Russian side, but merely from the Prussian authorities. Live cattle are compelled to go through a three weeks' quarantine at the borders, although the butchers have produced Bills of Health from the Russian authorities of the "Hauptman's Gericht" of Hasenpotf in Courland, and although it is a well-known fact that no cattle disease of any sort has been prevalent at any places near the borders for many years. There is a report that some disease had appeared at Johannisberg, the border town opposite the Prussian Stalla-

* Lord Bloomfield's, No. 272, June 30, 1855.

pahnen; but this is not believed. I am informed that a Prussian official is about to proceed to Courland to make the necessary inquiries.

According to official information, the murrain (cattle plague) continues to advance from Russia towards the Prussian frontier. The Government has therefore, according to the instructions in sec. 3 of the Order 27th March, 1836, resolved as follows:—

[These instructions were printed in our previous report on the Russian Cattle Disease.]

In order that these regulations may be duly observed, it is only allowed to cross the frontier in this district at the custom stations of Nimmersatt, Bajohren, Langallen, and Paschkenkrug.

The Provincial Counsellor,
(Signed) DIECKMANN.

Memel, 28th May, 1855.

A WEEKLY COUNCIL was held on Wednesday, the 11th of July: present, Mr. MILES, M.P., President, in the Chair, Earl of Yarborough, Mr. Camps, Mr. Corbet, Mr. Deere, Mr. Devas, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Jon. Gray, Mr. Fisher Hobbs, Mr. Horsfall, Mr. Knowles, Mr. Rodwell, Mr. Scott, Prof. Simonds, Mr. Crompton Stansfield, Prof. Way, Mr. William Wilson, and Mr. George Wood.

MR. PUSEY.—The Council received with deep emotion the announcement made to them, by Dr. Acland, of Oxford, of the death of their distinguished member, Mr. Pusey, whose name and labours will remain imperishably associated with the foundation, development, and successful progress of the Royal Agricultural Society of England, to whose interests, and to those of the agricultural community in general, his whole time and energies were so entirely and so successfully devoted.

PARIS SHOW.—Mr. Evelyn Denison, M.P., the English Juror for Agricultural Implements and Machinery at the Paris Exhibition, reported to the Council the progress of the trials in that department. He informed the Council that the trials of the implements in Class 6 were postponed until the Carlisle meeting had taken place, namely, until the very end of the current month. The implements and machinery in this class consisted of portable steam-engines, thrashing machines brick and tile machines, chaff-cutters, mills, and (generally) all fixed machinery. Mr. Denison was glad to find that Mr. Fairbarn, of Manchester, was the chairman of that class, as that circumstance would give the English exhibitors an opportunity of direct communication with him, in explaining to him at once all the minutiæ of their respective machines. Mr. Denison could not deny himself the pleasure of expressing the satisfaction which Mr. Amos (of the firm of Messrs. Easton and Amos, the Consulting-Engineers to the Royal Agricultural Society of England) had given to all parties, especially to the French exhibitors, by his professional abilities, and the fairness he had shown on every point connected with the trials.

PHYSIOLOGY OF MILK SECRETION.—Prof. Simonds, the Veterinary Inspector of the Society, delivered before the members a lecture "On the physiological conditions affecting the quantity and quality of milk secreted by the cow under different circumstances of feeding and management." Our space, on the present occasion, will only allow us to remark that the distinguished Professor, in this lecture, gave a masterly outline of this important and interesting inquiry; and, to use his own expression, "only skimmed the surface" of his subject. He presented, however, strong illustrations not only of the importance of his subject, but of its novelty to agriculturists generally, and of the extent to which the individual topics of inquiry would lead him, in order that full justice might be done to them; that "not only a single lecture, but a course of lectures," would be required for that purpose. The President, in requesting him to draw up a statement of his lecture, for the Society's Journal, to be submitted to the Journal Committee, expressed to Professor Simonds his personal thanks for his great kindness in delivering that lecture, and his sense of the great ability he had displayed in its illustration.

PRODUCTION OF BUTTER AND DAIRY MANAGEMENT.

Mr. Horsfall and Mr. Scott favoured the Council with their own experience, arrangement of collected facts, and individual experience in reference to this important and interesting subject, and received the best thanks of the Council for their kindness in attending the meeting of that day, and the trouble they had taken for the purpose of elucidating the points at issue in the wide question they had endeavoured to elucidate.

I. MR. HORSFALL'S STATEMENT.

In continuation of my remarks of the 21st, and calling attention to the discrepancy noticed in the average yield of butter of 196 lbs. a year, to produce which would only require a daily yield of milk of rather more than 7 quarts per cow, whilst his average of 10 quarts per cow would reduce the quality of his milk in relation to butter one-third of that shown by his tabular results, I now proceed to examine the statistics supplied by Mr. Scott, with the view to show how far they affect those in my former statement, to which Mr. Scott has thought proper to compare them. The experiments on the Munster model farm had previously engaged my attention; a copy of the number of the "Albert Journal," in which they first appeared, was kindly supplied to me by Dr. Kirkpatrick, the intelligent principal of the Albert Training Institution, who will allow me to claim him as an agricultural acquaintance of some years' standing. The same number of the "Albert Journal" contains observations on the effect of temperature on dairy produce, which I had supplied at Dr. Kirkpatrick's request, and to which I shall have occasion to refer. I had some thoughts of introducing these experiments on the Munster model farm in my first communication to your Society, as showing the greatest average yield of butter in proportion to milk from a number of cows on ordinary food which had come under my notice. Finding, however, that these experiments had only been continued seven days, a time wholly inadequate to arrive at a safe conclusion as to what would be the result over a lengthened period, I omitted to introduce them. Mr. Cunningham, who supplied these statistics, accompanied them with the remark, that they are not sufficiently comprehensive, and that he should renew the experiments this season. From the attention I have given to this subject I have a right to

give it as my opinion that the food is inadequate in one essential, that of maintaining the condition of the animal under a full yield of milk, and I hold it to be undoubted that impoverishment of the condition of a milch cow will lessen her ability to afford the same quantity and quality of milk which she would give if her condition were kept up. The next experiments are Mr. Scott's own; but let me here observe, by ordinary treatment I understand bulky ordinary farm produce, whilst by high feeding, such produce together with dearer, more concentrated food. Now, in looking over Mr. Scott's items of food, I observe in two an accompaniment of Oats; if he gave them a sufficient abundance they would complete the essential requirement I have mentioned, that of keeping up the condition, the main difference from my treatment being, that his food is more costly in proportion to its effect. In two others I observe bruised Furze, with the composition of which I am unacquainted, but if it answer the requirements I have named it will be strong food; it is certainly not ordinary farm produce. The next trial is on a Kerry cow, a breed which ranks first as a giver of rich milk; then a Galloway, also a rich milker; the remaining five trials taken together would furnish a very different average. In these seven trials no mention is made of the time under experiment, the description of food, season of the year, or of what I hold essential to a proper estimate of the effects of food, the maintenance of the condition of the animal. I may now say that having sought for information in the various treatises within my reach, I am not disposed to attach equal importance to these statistics of Mr. Scott as to those of the writers I have already quoted, and to which I will add Mr. Stevens, who, in his "Book of the Farm," arrives at a like result with Dr. Muspratt, that 8 to 9 oz. of butter per day may be considered a fair average for a dairy cow. The following description of my own dairy results was written for the "Albert Journal" in January, 1855. The peculiar richness of the cream had then begun to call attention, and was under strict observation, but I had arrived at no conclusion as to its cause. I had not then any intention of laying it under the notice of your Society. "The dairy practice of this locality is directed to the production of milk for sale when new, or butter and skimmed milk. The price of new milk is nearly uniform, being 2d. per quart; that of butter is sometimes as low as 1s. per roll of 24 oz., and sometimes nearly double this. The price of skimmed milk is likewise steady, being generally 1d. per quart. The cause of the fluctuation in the price of butter, with the steadiness of price in that of milk, will be found in the comparative ease of the transport of the one as compared with the other; the former is liable to damage by moving, whilst the latter is regularly brought to market by sea and land hundreds of miles. Butter is brought from Mecklenburgh, and from the west of Ireland, to London. It will then be obvious that the supply of new milk is limited to populous districts, or to such as have gained easy access to them by the introduction of railways. It is in some measure optional in what way my dairy produce is disposed of—in new milk, or in butter and skimmed milk. In giving attention to this branch of farm economy, I was led at an early period to enquire at what price the two processes afforded a like return. After several trials made during warm weather, my cows being on grass, with extra food, I found 16 quarts of milk yielded 26 oz. of butter; the quantity of cream varies with the skill or taste of the dairy-maid in skimming the milk, and in proportion as she mixes milk with the cream. I have frequently found a quart of cream to give 14 to 16 oz. of butter; the latter is about the average of the cream used for the trial churns at the Royal Agricultural Shows. With the observance of greater nicety in skimming, the cream being consequently thicker and richer, a quart may give upwards of 20 oz. of butter; if, however, the cream be wholly taken off, the yield of butter will in each case be about equal. The comparison will be—

	s.	d.
16 quarts of new milk, at 2d. a quart	2	8
16 quarts of new milk give a roll of butter of 25 oz., at 1s. 6d.	1	6
14¾ quarts skimmed milk, at 1d.....	1	2¾
	2	8¾

(Half the quantity of butter-milk covers the cost of churning).

Butter is sold here by the roll of 24 oz.; it is customary to make up the roll to weigh 25 oz., the odd one being in favour of the purchaser. I thus find an equal gain from new milk sold at 2d. per quart, as from butter at 1s. 6d. per roll, and skimmed milk at 1d. per quart. It will scarcely be necessary to observe that with a rise in price above 1s. 6d. per roll, it is my interest to direct my dairy produce more to butter, whilst with a lower price new milk pays better. In the course of a season or two, and towards the close of a year (late in November), I remarked a considerable falling off in my receipts for the dairy; and as no change had occurred in the number or circumstance of my cows, nor in their food, I was led to enquire into its cause. I found an equal quantity of milk had been brought down to the dairy-maid, a like sum received for new milk, and that the deficiency arose solely from a less quantity of butter. With this change there had occurred a great change in the weather, it having become very cold and frosty. I again tested the quantity of milk, and found the yield of butter 16 oz. from 16 quarts, instead of 26 oz., as on the former trials; up to this time I had used an underground cellar in summer, and a room on the ground floor in winter, during which time this deficiency in my butter occurred. This room is situated on the north side of the house, the in-door opening into the kitchen, where the culinary operations are carried on, and which door was usually kept close by day as well as by night. The room is lighted and ventilated by a trellis window, which gives free access to the frost and cold air. On trying the temperature I found it something below 40°; it then occurred to me that the deficiency of butter must arise from too low a temperature of my dairy, and an easy means of remedy at once suggested itself, namely to introduce with a supply of fresh or cold water a supply of hot water, by an apparatus for that purpose. It so happened that the pipes for both hot and cold water passed through my dairy immediately under my trellis window, and over the stone table on which my milk bowls are placed. This table is about two feet in width, and occupies two sides and the end of the dairy in which is the trellis window. I ordered a shallow open cistern to be made of wood, with a rim about three inches along each side, and lined it with thin sheet lead; this cistern thus contained water of 3 inches in depth. At its extremity and near the window is a hollow plug having perforated holes, at least 3 inches above the bottom, and through which the water escapes as it rises into the common sewer. At the other end of the table, and inside the rim, is a pipe which, being inserted into the one from the hot-water apparatus, conducts this to a tap, and then returns along the other side of the table again to the hot water pipe; when the new milk is brought in, it is set up when warm, and immediately the hot-water tap is turned, when the water flows from it and along the cistern in which the full milk bowls are standing, till it rises to the height of the holes perforated in the tube, and then flows through the same. The tap is open so long as the supply of hot water lasts; when this is exhausted, and the water in the cistern has cooled, the plug is drawn, and the whole of the water escapes, leaving the cistern empty. At this season the trellis window is closed by a wooden shutter, and the in-door communicating with my

kitchen is kept open. By these contrivances my dairy attains a temperature in winter of 52° to 54°. I superintended the experiment when first tried one evening. The next morning my dairymaid thus accosted me: 'Master, it is quite wonderful this morning, I have more cream from standing one meal than before from three.' When the churning day came, the result was a yield of butter of 26 oz. from 16 quarts of new milk, being equal to what I had found in summer. Thus from a change of temperature solely and without any change of cows, or in their food, my quantity of butter was increased 50 per cent. But this is not the only advantage of the plan: I have already remarked that along with the hot-water pipe, one with cold water passed through my dairy. At the approach of summer a pipe inserted into this with a tap close by that of hot water is turned, allowing the cold water to circulate in the like manner among the bowls of milk, till the cistern was filled to near 3 inches deep, when it again escapes through the perforated tube. This operation is continued through the hot weeks of summer, the tap being regulated so as to discharge a constant trickling of cold water, which is, of course, escaping through the tube at the other extremity, the milk bowls standing in water of the depth of near 3 inches during the whole of the summer season. I am thus enabled to allow my milk to remain two or three meals without becoming sour, and can sell it at the price stated, 1*l.* per quart. The advantage I gain from this is even greater than what I derive from the increased temperature during winter. These arrangements have been in operation several years, during which I have occasionally tested the yield of butter, and have always found it similar, varying only from 25 to 27 oz. from 16 quarts of milk, the greatest amount being observed in the month of December last, when it was found to be fully 27 oz. from 16 quarts. I may here remark that my milch cows are supplied in summer and in winter with food suited to their wants and to the office they are performing—the production of wholesome and nutritive milk. Since I adopted this mode of regulating the temperature of my dairy, I have read a lecture given before the Royal Society, by Captain Carr, an Englishman, who resides on an estate which he has acquired in Mecklenburg, in which country the produce of farming is chiefly directed to the production of butter, which is their main source for money returns, and where, as appears from Captain Carr's description, the arrangements of the dairy with regard to the production of butter are carried out with the greatest perfection, and in which regulation of the temperature is one of the chief aims. Captain Carr states that by an artificial heat they effect a temperature during winter of 60 deg. Now, with my present means, I am not able to attain more than 52 to 55 deg.; but as I have not during summer, when the temperature of my dairy occasionally exceeds 60 deg., found a greater proportionable yield of butter, I am led to conclude that the degree of temperature I have stated (52 to 55 deg.) enables me to acquire the whole of the butter which the milk contains. I may here remark that my dairy produce is under such control that any considerable variation in the quantity and quality of my milk cannot escape observation for more than a few days. If my dairy treatment afford superior results to those in the treatises to which I have referred, I may be allowed to explain my views of the causes by which these are influenced. The principle one I take to be the affording to the cow an ample though (in consideration of cost, if not of effect also) not an excessive supply of each element of food, suited to her requirements, constitution, and purpose. The milch cow may be said to have a twofold occupation in using her food—the production of milk, and the maintenance of her condition. The former is the favourite one; if the food supplied be inadequate for both purposes, the defective elements are diverted to the milk at the expense of her flesh, fat, and probably of her bone material also. That I have effected this may, I think, be safely assumed by what I have already stated, namely, that my cows, under all circumstances, maintain and improve their condition. I do not insist upon it that the materials I am using are the only ones by which this desideratum can be effected; but I do think that its due performance is requisite to ensure the greatest and most complete produce from a cow, of which she is capable. The remarkable quality of the cream I am disposed to ascribe to the character of the vegetable oil, in which particular my winter food differs most materially from that commonly used. I find that butter, on analysis, varies considerably in its properties of margevine and elain fats. I have seen this attributed to the difference of temperature of the season, that the summer butter contains more of the elain, the winter more of the margevine property. In the month of April of this year, when conversing with Mr. John Simpson, of Ripley, a sober-minded observant farmer, whose repute as such has gained the attention of his rector, the Rev. Mr. Thompson, and also who consults him on his farming operations, he told me he and a neighbour of his who had observed my mode of treatment of dairy cows, of which they had found particulars in a publication to which I occasionally contribute, the *Gardeners' Chronicle*, had been surprised at the consequent change in the appearance of the cream and butter; he described it as being that from ordinary winter to rich summer butter. The difference in the consistency of cream on different pastures is very observable. Within two miles of this place is a small pasture at Wharfside, Otley, in the occupation of Mr. Garnett, which has long been noted for the richness and solidity of its cream. When I formerly travelled in Germany, I well recollect on the road between Dresden and Teplitz, at a station near the boundary of Saxony, having been treated with rich milk and cream; it was evidently considered a rarity, as all guests, whether by eilwagen, post, or other conveyance, were invited to partake of it. The cream resembled in consistency and appearance the description I have given of that of my own dairy. I made the tour several times, at intervals of some years, when the like treatment was afforded; it could only be ascribed to the peculiar quality of the herbage in the vicinity of Peterswaldan, which is, if I rightly recollect, the name of the place. I have now to state that at the present time, when my cows have become accustomed to grass, and consume much less of the steamed food, there is a decided change in the quality of the cream: a jar which, when filled so as to be conveniently removed from the dairy to the scullery, where the churning is performed, say an inch from the top, and which the twentieth quart of water will cause to overflow, yielded during the winter season 18 rolls 6 oz, gives only, at present, from a like filling, 15 to 16 rolls of butter. The volume of cream is somewhat increased, but scarcely in the extent to compensate for the superior richness of my winter cream. I am thus led to think that the different varieties of vegetable oils influence the quality of the cream and butter. I now proceed to the consideration of the comparative pecuniary results of my treatment, and I feel called upon the more to do so, from observing that very erroneous views have been stated to your Society, to the effect that the only result attendant on my treatment is the enrichment of the manure. To explain my views, I ask attention to the description of my food, which will be found in my former paper. The bulky farm produce alone will be scarcely admitted by practice to have the property which the chemist will concede, that of maintaining the condition of a store animal; it is less costly than the ordinary food supplied for

the dairy purpose, and certainly not so efficacious. The extra food has, too, the like characteristics, a higher value in chemistry than in practice; and I here remark, that though I look on my neighbour's farm and watch his proceedings; though I have travelled to a distance with the like object, so that if I were to appear at Bainesse, Beal, or on other farms across the Tweed, I should be recognised by the well-known occupiers as a former visitor in quest of information; yet in regard to the treatment of live stock, the tendency of my experience is to strengthen my reliance on the chemical composition of food, and I now look to the analysis of an able chemist with greater interest than to the practice of others, or to the many feeding experiments which are yearly published. I now give you the results of my treatment on the different classes of animals, and commence with the cows for which I pay the highest price in proportion to their quality and condition—those near to calving. Now, on comparing the price I have paid for some years back with that realized when sold, and taking into account the sum I obtain for the calf, which I sell when a few days old, and deducting 10s. for its keep, I find these cows fetch on an average more by 3*l*. to 5*l*. each than what I pay for them; at the same time, I am purchasing from dairymen similar cows, but which have undergone impoverishment by ordinary treatment, at less by 3*l*. to 5*l*. each than had been paid for them. I do not overstate the matter when I claim a gain in comparison with ordinary treatment of 6*l*. 5s.; if I allow them to average 50 weeks in hand, it leaves 2s. 6d. for each, for the extra feeding. I also gain a saving in time; instead of a course of feeding which would be requisite to furnish the impoverished cow for the market, my cows are draughted off within a few weeks of becoming dry. At times my purchasers select them as fit for their purpose before they are quite dry; but beyond this I perceive an advantage in the quantity and also in the quality of my milk. I think it is not the least remarkable feature of my treatment that the milk from my stall or winter food is equal in quantity, whilst in the various experiments it has rather the advantage in quality, as compared with that from grass or summer feeding. Of the next class, the cows bought are in incipient calf, giving six to seven quarts per day each, but which invariably increases on my treatment. I mention those of which I gave the weight when bought and after they had calved; these show a gain of 180lbs. each, and which cost respectively 12*l*. 10s., 12*l*. 12s., and 13*l*. 2s. 6d., and would have readily fetched 18*l*. each; indeed I could not have purchased cows of equal quality and condition for this sum when near calving. I now mention another advantage of what is called high feeding of dairy cows; it enables me to milk them close up to calving time. I rarely dry my cows which I have had a sufficient time in hand to furnish them properly, till within a month of calving; this gives me a month more for milking than I should think advisable with cows in low condition, a practice in unison both with experience and common sense. I now come to a third class—the cows which I purchase from dairymen giving a low yield of milk, say 6 quarts per day; in regard to these, I find, without exception, that with me their yield of milk increases in the course of a week or two about 2 quarts per day. These cows, being in a barren state, hold much better than when in-calf to their yield of milk, and rarely get below 5 quarts per day when fat. Now, I have shown by weighing through a lengthened period, that with a yield of milk which will not average less than 6 quarts per day, they gain at the rate of 7lbs. to 9lbs. each per week. I think I may admit that the feeding of this class of animals is attended with profit; it exceeds much what I obtain from mere fatting. The cost of the auxiliary food which I am using, including that of coal and labour, will be about 3s. a week for each cow. I now call attention to the profit from manure which has been insisted upon to your Society, and responded to by conductors of agricultural publications, who, if they do not possess, ought to acquire the means of discriminating and calling attention to such statements as are sound and worthy of approval, as the only advantage that I derive from high feeding. Now, I entertain a different persuasion. I hold this advantage to be, comparatively speaking, a minor one. In my former statement I attempted to show what portion of the elements of the extra food which are value for manure are carried off in the milk. In the class of full milk there will be little left for the enrichment of the manures; still there is something, as a cow maintaining her weight and condition will doubtless give richer manure than when losing flesh. In the other stages the comparative value of the manure is somewhat greater; yet, if I allow 3lbs. per day of my extra food, or 21lbs. per week, to go to the manure—and this is really more than I should feel satisfied with—the value of these 21lbs., taking into account the loss by exudation, will, in manure, be about 6d. If we compute the value of manure from a cow under ordinary treatment as worth 1s. 6d. per week, and add the 6d. per week for extra food, the result will be 2s. per week, which is about equal to what I have found my cattle manure to be, on the analysis of Prof. Way. I cannot entertain or understand the teaching of those who insist that the only advantage of high feeding is one of manure. What does this amount to? Nothing less than that those who supply their animals with extra food, and amongst these may be comprised almost all the first class of farmers, are employing a ready means of converting their shilling into less than sixpence. It will be found that substances used as food, when deprived of their more valuable attribute, food for cattle, and retaining only that of food for plants, lose more than half their value; whilst if you convert them into milk, beef, or food for man, their value is increased in much greater proportion. I hold it then to be a sound theory, and one which I have sought to carry into practice, to convert my produce as much as possible into food for man, and to increase, rather than to enrich my manures.—THOMAS HORSFALL, *Burley Hall, July* 3, 1855.'

I now supply the following particulars, with the view more clearly to explain the results of my treatment on stall or winter feeding. Two cows, which calved in September, the one a 3-year old light heifer, yielded soon after 14 quarts per day. The other, after her third calf, yielded at the rate of 18 quarts per day. In the month of June they were found to give respectively 10 and 14 quarts per day. Their weights were—

	Oct. 31st.			June 22nd.			Gain in wt.
	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	lbs.
Heifer..	8	1	0	9	2	0	140
	9	2	0	10	2	0	112

	Per week. s.	d.
Taking the former to have averaged 12 quarts per day, at 2d.	14	0
Taking the latter to have averaged 16 quarts per day	18	8

The yield of excrement, 5 cwt. 1 qr. per week, will be fully at the rate of 2s. each per week; the cost of the extra food may be assumed at 3s. 6d. per week each, as they would get more than an average. The milk of these two, tested by the lactometer in the month of June, was of superior richness. The gain in richness of manure, consequent on high feeding, I shall not estimate at more than 6d. per week. Two cows—one bought in September for £10 10s., the other somewhat before for £12—each increased to about 8 quarts per day, and were

continued in milk till the close of March, when their yield was reduced to about 5 quarts each per day. They weighed—

In September.			In May and June.		
cwts.	qrs.	lbs.	cwts.	qrs.	lbs.
8	0	0	10	2	0
10	1	4	13	1	0

The former was sold in May for £18 10s., leaving	£8	0	0
For milk during 24 weeks, 6s. per week	7	4	0
	£15	4	0
The latter was sold in June for £22 1s., leaving	£10	1	0
For milk during 24 weeks, 6s. per week	7	4	0
	£17	5	0

The excrement would be richer, and its value may be assumed at 2s. 4d. per week. The enhanced value of the manure I shall not be disposed to estimate at more than 8d. per week, or for the 34 weeks £1 2s. 8d. The extra food will have cost at the rate of 3s. per week each. The ordinary farm food has consisted of—

12lbs. of meadow hay each per week.
10lbs. bean and oat straw and shells of oats per week.
32lbs. roots, mangold, &c., per week.

This ordinary farm produce will be found about equal in nutritive property to what is found requisite to maintain the condition of the animals in store state and without other occupation. Will it not then appear that the other results are mainly derived from the extra food? T. HORSFALL.

II. MR. SCOTT'S STATEMENT.

" 5, Charing Cross, July 11.

" In compliance with the invitation of the Council, I have had much pleasure in meeting Mr. Horsfall here to-day. At the same time I trust it will be clearly understood throughout this discussion that I have no personal feeling on the subject; I am committed to no crotchet, and have no theory to defend. I expected the paper read by Mr. Horsfall would have contained some new matter in further elucidation of his practice; but as this did not appear to my mind to be the case, I shall briefly address myself to his two commentaries on that part of my paper of the 30th of May which related to his reported practice. In those commentaries Mr. Horsfall appears to be more anxious to find flaws in my statement than to simplify and reconcile his own: for instance, I incidentally state that 'an average cow will produce 196 lbs. of butter a year,' to show the national gain that would be obtained on this quantity by raising the quality 1d. per lb. in price. Further on I state 'that the average annual produce of a first-rate cow, well kept throughout a season of nine months, or 270 days, seldom exceeds 2,700 quarts of milk, yielding 262½ lbs. of butter.' This Mr. Horsfall utterly ignores, although the 262½ lbs. of butter is the point he should have dealt with. Mr. Horsfall, further, in defiance of my stated figures, assumes that the 196 lbs. of butter is the produce of 300 days' milk. He thus increases my quantity of milk relative to butter, and thereby creates a disparity, favourable to himself of course, between his produce and that of other dairy farmers, which does not appear in my paper, and did not previously in reality exist. Mr. Horsfall must in candour admit that this 196 lbs. of butter forms no part of my case in which I deal specially with him, and that no mention of 300 milking days is made by me. The real and original question, as raised by Mr. Horsfall, is the scientific economy of his mode of feeding, and the amount of his production. The announcement of a return of 25 oz. of butter per quart of cream led us at first to believe that he had exemplified, in his practice, a system by which the ordinary dairy farmer could increase his profits. Investigation has proved this to be an entire fallacy. Mr. Horsfall's cows do not appear to produce more milk in a year than other ordinary well-managed cows; and while from 10 quarts of his milk he extracts 15.78 oz. of butter, I have shown from the average of a number of trials in different counties, with different kinds of cows, under diversified management, and not got up for experiment, a produce of 15.68 oz. of butter from an equal quantity of milk.

	lbs.
His annual produce from a cow is	266.28
As against	264.60
Leaving in his favour on a single cow for a whole year,	1.68

only. I abstained from taking the individual examples adduced by me, several of which I was personally acquainted with, because the produce in several cases so far exceeds Mr. Horsfall's—thus, from 10 quarts of milk:—

One batch of cows yielded	19.70	oz. of butter.
Another	16.84	„
Another	22.00	„
Another	17.42	„
Another	16.32	„
5) 92.28		
Which, on an average, is	18.45	„
Whereas Mr. Horsfall's yield is only ..	15.78	„
Leaving him minus	2.67	„

on 10 quarts of milk. I merely recapitulate these data to show the logical absurdity of picking out from my paper 196lbs of butter, and, after arbitrarily blending it with imaginary figures of his own, presenting the result as my case. The editor of the *Agricultural Gazette* pursues the same course when he remarks, 'If the short-horns and the cross-breds are taken for comparison, Mr. Horsfall's yield of butter from the milk is one-third higher than the average of Mr. Scott.' Now if the cross-breds and Kerries in the same table are taken for comparison, Mr. Horsfall's yield of butter from milk falls one-fourth short of my average; and if the cross-breds are taken alone, one-third. But, further, while Mr. Horsfall's average produce of milk per day is not more than 10 quarts, yielding 15.78 oz. of butter, the produce of the shorthorn in my paper is 17 quarts per day, yielding 18 oz. of butter; and of the cross-bred 10 quarts, yielding 22 oz. of butter; and in the case of the other two cows in Cheshire, mentioned by me, the daily produce of the one was 40 quarts of milk, yielding 2 6-7ths lbs. of butter; and of the other, 36 quarts, yielding 2 5-7ths lbs. of butter. Those are all rather extreme cases, and I merely mention them to show the disingenuousness of exclusively selecting those of an opposite character, to make out a desired case. The editor of the *Agricultural Gazette* also remarks, that 'Mr. Horsfall's yield of butter from the cream thrown up is unprecedentedly large.' True: but he should at the same time remember the fact that the quantity of cream thrown up is unprecedentedly small, being only 0.64 parts of a quart off 10 quarts of milk, whereas the ordinary extract is 1.27 quarts. Up to the present time we are, therefore, left to infer that the extra richness of Mr. Horsfall's cream may simply be the result of a little manual dexterity in skimming. Nor must it be overlooked that Mr. Horsfall's assumed annual yield of 3,000 quarts of milk per cow (representing 295.87lbs. of his butter) is not an ascertained fact, taken from a carefully kept daily register, but only an estimate 'which he is disposed to think is not more than a moderate average on dairy cows properly maintained.' If Mr. Horsfall brought forward the astounding fact of his having obtained 25 oz. of butter from 1 quart of cream, under the impression that this was the result of his

special system of feeding, and that it was a new and valuable discovery, I think he must now admit that he was not warranted in coming to such a conclusion, and that I have shown that his produce of butter from milk is equalled, and in many cases exceeded, by ordinary dairy farmers. That such results as his can be obtained by certain modes of manipulating the cream, one of the numerous returns which I have obtained, and now submit to the Council, tends to confirm. By it I perceive that the average produce of butter in Devonshire from 1 quart of scalded cream is 22 oz., the milk required to produce this cream being 17½ quarts. Mr. Horsfall has stated to-day that the experiments made at the Munster Model Farm last year, and quoted by me, extended over too short a period to be of reliable value, and that Mr. Cunningham, the manager, and Dr. Kirkpatrick, the Head Inspector of National Agricultural Schools in Ireland, had in consequence written him to say they would be repeated. They have been repeated; and, by Dr. Kirkpatrick's permission, I have them here to-day. I visited both the National Model Farm at Glasnevin and the Munster Model Farm last week; and, from the careful manner in which all the operations carried on are registered and attested, I think they may be relied on. Well, I find that the results obtained in 1854 are confirmed by those obtained this season, and that 9.67 quarts of milk produce on an average 16 oz. of butter; whereas it takes 10.14 quarts of Mr. Horsfall's cows' milk to produce 16 oz. of butter. I think these returns, from actual experience, will lead to more correct conclusions than the closet calculations of theoretic writers; and I therefore prefer them. I may here again remark, in acknowledgment for the Irish statistics, that, though that country has not yet become a good school for practical farming, we are indebted to it for the many and carefully-recorded experiments now being made at its agricultural seminaries, under the Board of National Education, on the principles and practice of farming. To show, however, how little dairy farmers at present know or are willing to communicate about their business, the Secretary of the Royal Agricultural Improvement Society of Ireland lately put a series of queries on dairying in the Society's Journal, at my request, and did not receive a single answer to them. Mr. Horsfall has the merit of having now set many dairy farmers a-thinking, who might otherwise all their days have gone on mechanically; and he has also done good in personally devoting his time to the investigation of the principles of dairying. He must not prefer science to practice however, but the reverse; and if he continue his experiments, I would venture to suggest that he must simplify the details of his operations, and bring them into less com-

APPENDIX, BEING ADDITIONAL DAIRY RETURNS OBTAINED BY MR. SCOTT, AND REFERRED TO IN THE FOREGOING LETTER.

(These Dairy Returns are given just as they came into my hands, none having been kept back. They represent the produce of upwards of 1,000 Cows.—THOMAS SCOTT.)

ENGLAND.

	Names of Reporters.	Counties.	Breed of Cows.	Days milked in a season.	Aggregate yield.	Milk to produce 1 quart of cream.	Butter from 1 quart of cream.	Summer Food.	Winter Food.
				Days.	Quarts.	Quarts.	Ounces.		
1	Sargent	Wiltshire	Shorthorn	270	2,160	8	16	Pasture	Hay and Roots.
2	Blake	Do.	Shorthorn	240	2,520	11	16	Do.	Do.
3	Lavington	Do.	Shorthorn	255	3,060	14	16	Do.	Do.
4	Akroyd	Cheshire	Crossbred	240	2,880	16	16	Do.	Do. and Oats.
5	Cawley	Do.	Yorkshire	270	3,465	11	16	Do.	Do. Cut Straw, Oats
6	Warburton	Do.	Half-bred Shorthorn	240	2,640	8	12.80	Do.	Do. and Oilcake.
7	Randall	Devon	Devons, Jerseys, and Shorthorns	320	3,840	17.50	22	D. & Brewer's Grains	Turnips, Carrots, Hay, Straw, and Grains.
8	Franks	Hunts	Yorkshire	240	1,440	18	12	Do.	Hay, Roots, & Cake.
9	Thorpe	Do.	Half-bred Yorkshire	180	2,520	12	8	Do. and Oilcake	Do.
10	Sherret	Hereford	Hereford	240	1,920	9	14	Do.	Hay, Straw, & Roots.
11	Wright	Surrey	Yorkshire	270	3,240	12	16	Tares, Clover, &c.	Roots, Hay, & Grains
12	Castle Howard	Yorkshire	Shorthorn	238	2,142	10	16	Pasture	Oats and Hay.
			12)	3,003	31,827	146.50	180.80		
			England average	250	2,652	12.20	15.06		

IRELAND.

1	Haydon	Kerry	Crossbred, Kerry, Durham, and Ayrshire	285	1,995	12	14	Pasture and Cut Grass	Hay and Roots.
2	Dalton	Limerick	Crossbred, Irish, and Shorthorn	270	2,430	10	10.66	Pasture, Clover, and Vetches	Do.
3	St. John Jefferys	Cork	Half-bred Shorthorn	270	2,700	10	12	Pasture and Cut Grass	Do.
4	Munster Mod. Farm	Cork	Crossbred	270	2,970	8.06	13.33	Cut Grass & Clover	Do.
			4)	1,095	10,095	40.06	50.00		
			Ireland, average	274	2,524	10.01	12.50		

SUMMARY.

England	250	2,652	12.20	15.06
Ireland	274	2,524	10.01	12 50
2)	514	5,176	22.21	27.56
General average	257	2,588	11.10	13.78

THOMAS SCOTT, 5, Charing-cross, July 11, 1855.

N.B.—The above returns of the produce of upwards of 1,000 Cows, show a general average of 1.24 oz. of Butter from one quart of whole Milk.—T. S.

pass; and then, when he obtains any useful results, the agricultural public will not fail to appreciate them. A balance-sheet would always be a useful accompaniment to these returns, and would enable us to judge whether or not his practice could be safely recommended to the ordinary rent-paying dairy farmer. Testing the data he has already furnished us with, and applying them to 100 quarts of milk, the account would stand as follows:

By Mr. Horsfall's process:

Cream from 100 qts. of milk,	6.40 qts. = 157.80 oz. of butter,	at ¾d. per oz.	=	9s. 10¼d.
Butter-milk „ „	1.92 „	at ¼d. per qt.	=	0s. 0½d.
Skim-milk „ „	87.30 „	at ½d. per qt.	=	3s. 10¾d.
				13s. 9½d.

Average by ordinary process:

Cream from 100 qts. of milk,	12.70 qts. = 156.80 oz. of butter,	at ¾d. per oz.	=	9s. 9½d.
Butter-milk „ „	7.60 „	at ¼d. per qt.	=	0s. 2d.
Skim-milk „ „	87.30 „	at ½d. per qt.	=	3s. 7½d.
				13s. 7d.

Difference in favour of Mr. Horsfall, on 100 qts. of milk, 2½d.

"I must also remark, that the butter shown by Mr. Horsfall to-day would not be considered first-class in London; the colour and flavour were very good, but the texture was decidedly faulty, as I pointed out to him, being full of air cells, and requiring the application of the 'pugging machine.' In conclusion, the primary object of all dairy farmers must be to obtain the largest product from a certain number of cows and a certain quantity of food. Physiologically, some cows have a superior tendency to secrete and yield milk over others, just as we find one breed of cattle and sheep become fat on food that would hardly maintain other cattle or sheep in a stationary condition. In my communication to the Council of the 30th of May I have enumerated the most essential points to be borne in mind by the dairy farmer, and if these are carefully and punctually attended to, they will generally ensure good management in the dairy.

"THOMAS SCOTT.

"P.S. I submit a specimen of the herbage, and a sod of the limestone pastures of Muckross Abbey, Kerry, and three specimens of coral and shell sand dredged in Bantry Bay, and usually applied to almost all crops in the southern and western counties of Ireland.—T. S."

At the request of the Council, Mr. Brandreth Gibbs undertook to ascertain the quality of the herbage Mr. Scott had brought over from fertile and barren dairy-land in Ireland; and Professor Way undertook to analyze it, as well as the mineral specimens with which it was accompanied.

The Council having received with thanks, and referred to the Journal Committee (along with Mr. Horsfall's and Mr. Scott's) numerous communications addressed to them by different members from various localities on Dairy subjects, adjourned to Wednesday, the 18th of July, at noon, when Professor Way would deliver his lecture "On the use of Fish as Manure."

A WEEKLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday, the 18th of July: present, WILLIAM MILES, Esq., M.P., in the Chair, Sir Stafford Northcote, Bart., M.P., Mr. Addison, Mr. Astbury, Mr. Raymond Barker, Dr. Calvert, Colonel Challoner, Mr. T. T. Clarke, Mr. Corbet, Mr. Deere, Mr. Gadesden, Mr. Jonathan Gray, General Hall, M.P., Mr. Marshall, M.P., Mr. Nottidge, Mr. Mainwaring Paine, Mr. Thomas Scott, Mr. Smithers, and Professor Way.

LECTURE ON THE USE OF FISH AS MANURE.

Professor Way, consulting chemist to the Society, commenced his lecture by referring to the importance of the subject. The employment of artificial manures, however much it might have extended, was yet in its infancy, and in the course of 10 years it was probable that 100 acres would be artificially manured for every acre that was so treated now; but this could only happen with the aid of fresh sources of supply of the raw material for the manufacture of such manures. There was the greatest difficulty in obtaining the material to supply the manure market. In the case of phosphate of lime the demand had so increased that the price had nearly doubled in the last two or three years. It was, however, fortunate that phosphate of lime, occurring very largely as a mineral deposit, had been searched for and found in several localities, and other supplies of it were opening up, which promised eventually to meet any demand. No less important than phosphate of lime, as an element of manure, was some form of nitrogen, of which the value was so abundantly proved. Now it could not be doubted, as he hoped to show, that such a source of nitrogen, in the highest degree available for the wants of vegetation, existed in fish. This source of nitrogen was practically unlimited, and he could not think that the obstacles in the way of obtaining it in sufficient abundance and at a moderate price were by any means formidable. The importance of this subject Mr. Way said he felt to be so great that, although it had been ably discussed before, and he might not be able to add anything very new to what had been previously said, the present lecture would, he believed, be productive of good, if only in keeping the attention of the agricultural public alive to the question. Of the value of fish and fish-refuse as manure there could be little dispute. For a very long period the refuse of the pilchard fisheries in Cornwall, and of the herring fishery in the eastern counties and in Scotland, had been employed as manure with the best effects. And in seasons when they were abundant, some kind of fish were caught expressly for this purpose—as in the case of sprats in the counties of Essex, Kent, and Sussex—the dog fish in Dorsetshire, &c. The use of fish, however, in its natural state was necessarily confined to a comparatively short distance from the place where it was caught; so valued, however, was this manure that he had seen Hop and Wheat fields covered in the winter with sprats at a distance of 25 miles from the sea, and that before the days of railways and when the farmer had to send his teams to fetch them home. There was abundance of evidence of the value of fish as manure, and the question was to what that value was to be referred. Mr Way then gave a statement of the composition of different fish, exhibiting a table of analyses lately made in his laboratory on the subject. He remarked, in the first place, that the quantity of water in fish was not nearly so great as was usually thought. It was a vulgar error to suppose that fish was less solid than flesh; on the contrary, whilst the flesh of the ox contained as much as 77 per cent. of water, different kinds of fish varied from 60 to 65 per cent., and some contained much less than this even. The quantity of nitrogenous matter in fish varied considerably: to this ingredient no doubt a great portion of the manuring property of the fish was due. We had experience of the value of dried blood, of woollen rags, of horses' hair, and other animal substances, all of which were powerful

manures; and the nitrogenous parts of fish being of the same composition, could not fail to have the same effect upon vegetation. The next ingredient in fish was the oil. The Society would remember that he published in the Journal, in the year 1848, analyses of experiments made in that and the preceding season, and that he had found in those fish as much as 18 or 19 per cent. of fatty matter; a result which was at that time, he believed, quite unlooked for. Mr. Sullivan had more recently found 13 per cent. of oil in herrings. They would see by the table of results that the oil in different fish varied very much; in one case, that of mackerel, it was remarkably large. In a mackerel examined this last week, he had found as much as 24½ per cent. of oil, or one-fourth part of its entire weight. In this fish the oil seemed to substitute part of the water found in other varieties; for it did not contain more than 44 per cent. of moisture, or two-thirds of that usually present. The quantity of nitrogen and of ash was also very large; both of them very considerably larger than in any other fish of which the comparison was known. If available in quantities, therefore, this fish would be very valuable for manure. Now, considering the large proportion of oil in fish, it became important to consider of what value it might be in manure. It had become the fashion of late years to give too exclusive a consideration to the importance of nitrogen in vegetation—not that we could too much value this important element, but that we were in danger of neglecting those substances which took a less prominent but a no less necessary part in the economy of vegetation. That carbonaceous matter in the soil was beneficial, if not indispensable to profitable cultivation, did not seem to admit of a doubt; and if so, there might be clearly a choice between carbonaceous substances, according to their rate of decomposition, &c. Now, oils were very susceptible of oxidation, with the production, of course, of carbonic acid. He might only mention, in illustration, the spontaneous combustion often occurring when oily rags used for machinery, &c., had been thrown into a heap, and by the absorption of oxygen and heat consequent thereupon, it had, in many cases, caused great destruction of property. Then, again, the manufacture of "drying oils," as they were called, by boiling linseed and other oils in contact with the air—the experiments of Saussure, who placed different oils under receivers of air, and found at the end of the experiments that all the oxygen had become carbonic acid at the expense of the oil—were also to the purpose. Now it was easy to see that oil distributed through a porous soil would, on account of the great surface exposed, suffer rapid oxidation, and give off a ready supply of carbonic acid, which at particular periods of their growth might be most important to some plants. Mr. Way quoted passages from the work of Dr. Home, printed in 1762, and the "Georgical Essays" of Dr. Hunter, a few years later, to show that a very high opinion of the value of oil as manure was held by early writers. He also referred to the experiments of Earl Spencer with oil—to the use of whale-blubber, which, however, no doubt owed much of its value to the flesh. He showed also that many of the substances known as powerful manures, and containing nitrogenous matter, also contained oil. Thus woollen rags, rape-cake, &c., might owe part of their efficacy to this cause. Rape-cake contained about 4 per cent. of nitrogen, whilst its oil varied from 12 to 15 per cent. Again: Shoddy (or wool refuse), with perhaps in some cases, as he had found, not more than 2½ or 3 per cent. of nitrogen, furnished upon analysis between 25 and 30 per cent. of oil. This substance was known as a good manure. On the whole, this subject of oil, as manure, was well worth looking into; not that oil would be likely to be used directly as a manure (its value for other purposes being opposed to such a use of it), but that we might be able to value more correctly substances in which it occurred, and could not profitably be extracted as suitable for manure. He would be glad to find that any members of the Society would be induced to make practical experiments on this subject. The other main ingredient of fish was the ash or mineral matter, which, although of less importance than the others (on account of the smallness of its proportion), was not to be overlooked. Mr. Way here referred to the analyses of different fish, showing that in the lobster, which he had recently examined, the quantity of phosphate of lime was as much as 5 per cent. of the fish in its dried state, and about the same in the mackerel: this phosphate of lime could not be without its use. Mr. Way next directed attention to the various methods of preserving fish that had been proposed, including those of Mr. Petit, by sulphuric acid; of Mr. Elliott, by the use of alkali; of Mr. Bethell, by the employment of tar-oils; and of M. de Molons, by treatment with high pressure steam. He also mentioned the plan which was adopted by a manufacturer of manure (Mr. Stevens), who had a contract for the refuse fish of Billingsgate market, of incorporating the fish in superphosphate of lime, the quantity of water in the fish serving to dilute the acid, and being dried up by the natural heat of the process. He remarked, however, that there would be no difficulty in preserving the fish if it could be obtained. It was not so much a question of this or that process, but of the supply of raw material. He could not help believing that this was not an insuperable difficulty if systematic measures were taken to effect the purpose. Was it affirmed that our system of taking fish was incapable of improvement? Were the nets and other appliances of the fishermen, which were the same in kind as we read of 1800 years ago, although possibly improved in detail, were they the last and supreme effort of ingenuity and invention? Was nothing to be accomplished in the way of extracting from the waters of the sea a greater supply of its teeming population? Surely it was open to improvement. But it seemed to him that the calculations and arguments on this question were not usually quite to the point. Everybody talked of "refuse" fish, that is to say, the offal of edible fish, and the fish accidentally caught which were unfit for the food market; and it was said by those who certainly well understood the subject, "a boat with so many men will take in the day such and such a quantity of fish, of which the uneatable fish will amount to so and so, and that quantity will not keep a factory in work or create a manufacture of any national importance." But he said that fishing for manure must be the primary, and the capture of edible fish the secondary consideration, if they desired to raise this into a great national question. And we had yet to learn what would be the result of a day's labour of a given number of men, when their attention was directed, not as now, to the comparatively rare and valuable fish, but to those which hitherto they had despised and avoided. In his opinion, the statistics hitherto put forward were worth nothing, because they were not derived from this point of view. In the search after fish for the manufacture of manure, the proverb that "All is fish that comes to the net" ought to be varied to "All is fish that the net can reach." Prof. Way concluded his lecture, as he had begun it, by urging the necessity of encouraging every attempt to obtain new sources of raw material for the manufacture of manure. Without this, a term would be reached when the competition for manufactured manures, with an insufficient supply, would raise the price up to the extreme limits at which their use would be remunerative—for a time the deficiency would be met by adulteration and inferiority of the article; and this, together with the scramble to get manure, would soon wean farmers from their partiality to artificial

manures. Then, indeed, the progress of agriculture in this country, at all events in the use of artificial manures, would receive a serious check. He did not wish to draw a gloomy picture; but such a state of things must inevitably result, if the increasing demand for manures were not met with some new and abundant supply of the raw material.

On the motion of General Hall, seconded by Mr. Gadesden, the best thanks of the meeting were voted to Professor Way for the excellent lecture he had then delivered; the President expressing the pleasure it gave him to put and concur in that vote.

Dr. Calvert remarked on the curious circumstance of some animals, low in the scale of existence, giving out ammonia while alive. He thought the source of ammonia a most important inquiry. With regard to insufficient supplies of manuring matter, he believed the Dutch and Chinese, who for ages had known its value, found no difficulty in securing it for their crops, while in England and other countries it was allowed to run down the rivers, not only polluting the water, but destroying the fish. A singular effect of gas-tar had occurred to him: when poured over and mixed up with a manure-heap in his yard, it occasioned on decomposition a most agreeable and powerful odour of bitter-almond oil to be exhaled; but the manure itself so strongly impregnated the Potatoes, to which it was afterwards applied as manure, with a rank foul flavour, that they could not be eaten. No particular increase of crop, either, had resulted from the manuring in question.—Mr. Paine gave an interesting statement of a series of experiments he had made on four acres of his land in Surrey, for the purpose of ascertaining the best manure for his Hops. The manures tried were of mineral and organic substances, alone as well as mixed, and each plot consisted of one-eighth of an acre. This land offered great variety of soil, resting on the upper and lower chalk, the firestone and the gault. The result of his trials was that Rape-cake, singly and in combination, for four years in succession proved invariably the best carbonaceous manure for his crop and land. He had found Hops, Turnips, Cabbages, Mangolds, and generally all large-leaved and rapidly-developed crops benefited by fish, whale-blubber, oil, and fatty matters; but that, on the contrary, his corn crops derived no benefit whatever from carbonaceous manures.—General Hall cited the case of Mr. Nash, of Newmarket, who had applied Rape-cake to his Wheat crops on chalk land with great advantage.—Mr. Truesdale Clarke referred to the Earl of Essex's employment of powdered charcoal in his experiments published in the Journal.—Dr. Calvert referred to his cultivation of the best-selected Grasses in Yorkshire, twelve miles from the Northallerton Station, and invited members proceeding to the Carlisle meeting to diverge to that extent from their route, for the purpose of inspecting what he believed to be a unique collection, the result of 20 years' uninterrupted care and attention. He had found less nutriment in Grasses grown on exposed situations than in those in the shade. He had found no season more favourable for his Grasses than the last. He had in preparation a report on this subject for presentation to the Society.

The Council adjourned to a special meeting at Carlisle on the 27th of July, and to their ordinary monthly meeting in London on the 1st of August.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

CARLISLE MEETING.—PRELIMINARY PROCEEDINGS.

It has been our privilege to attend many of the deeply-interesting meetings of the Royal Agricultural Society of England; which we have looked forward to as our great annual treat. We have never been disappointed hitherto, in the high expectations we have indulged in relative to them, and we are this year sanguine enough to anticipate a more favourable renewal of our pleasure than usual. Perhaps the historical associations connected with the immediate part of the district comprised within the Society's operations for the year—the vicinity of scenery of many a border war, now giving place to that happy emulation as to who can best promote the peaceful arts of husbandry, the scene, or nearly so, of many a border gathering "to levy black mail," of summoned clans going forth to raids and plundering, now for the first time to be the scene of one grand harmonious gathering of "Borderers," the union of all clans of all Baronies, with their fellow-countrymen from far and near, to advance the best interests of agriculture—that true foundation of a nation's wealth—may have raised our expectations. But, be this as it may, we certainly do anticipate a great and satisfactory meeting, favoured as we are by the intimation of an unusual entry for the stock classes, and a more careful selection for the implements.

It is not one of the least important plans or objects of these migratory meetings of our great society, to make us acquainted with the agriculture of the districts comprised in their visit, and *vice versâ* to make the district visited acquainted with their operations; but it also gives to agriculturists generally a most favourable opportunity to become informed of the state and practice of agriculture in all the districts through which they pass, on their way to these annual gatherings. It is thus that agricultural knowledge is practically commu-

nicated; for, write as we will, and publish all we write in the cheapest and most acceptable form, we cannot at all compare our writings in utility with the practical lesson the unread farmer would take from his own personal observations, and the deductions he would arrive at. We left our home with the view of improving our own agricultural knowledge; for it is a subject which never cloys with us, and is never fully learnt by any. Our way led us partly through the Midland Counties, immediately northward by rail. But rapidly as we passed, our impressions of the crops and course of management, we thought, might be tolerably correctly given notwithstanding; for instance, we could gather a fair idea of the state of the crops—their bulk and maturity; the proportionate quantity under different kinds of grain; the state and order of culture of the turnip and other root crops; the state of the grass and seed crops. We could also see, and that pretty correctly, the kind of stock kept in the different districts through which we passed, and discern much as to their general quality. Yes! not whether it was Leicester or longwool, Down or half-bred; but the character of the animals—their form and appearance; and the same with respect to cattle. A practical eye needs not a long look, to discern the character of an animal. To discriminate between animals of equally equally good formation and character, does indeed require great discernment and a correct judgment. This is quite true; but it is of general form and character we now speak. To discern, for instance, between the many varieties of *true-bred* Leicesters; the small compact rotundity of frame of what some of our breeders call the old Bakewell Leicesters (differing greatly as they do), and those fine, handsome, well-formed animals shown by a Pawlett or a Sanday; or, again, of those long-bodied, thin-necked, wool lank-stapled sort one sees so many of, compared with those large ones shown by Abraham and others. We repeat that we could form a tolerably correct idea of the state of the crops and the character of the animals by the way, although passing with such rapidity by rail; and we maintain that this is one way of taking proper advantage of the migratory visits of our great Society to its different districts.

We will, as briefly as possible, jot down some observations on our journey to Carlisle, making it also, as we did, a visit of pleasure to "the Lakes." The home counties, as a whole, do credit to their agriculturists. A fair proportion of each kind of grain is grown, which is looking pretty well—nothing very unfavourable, nothing very good. The wheats are rather thin, but the earing is fine. Barley, here and there, laid by storms. In Lincolnshire (for we travelled by the loop line of the Great Northern Railway to Leeds), on some of the high lands, the wheats are much laid, and seriously injured. The Fen crops are very bad. Oats look "sturky," and late. Beans are good. Grass lands, throughout our whole journey, appear to have recovered from the frosts and drought of the late untoward season, and are carrying a fair amount of stock. As we advanced further northward, the character of the country began to change for the worse. The major portion of Lincolnshire, and of Nottinghamshire adjoining, through which we passed, did not denote much good farming: the crops were thin and unpromising; the turnips in some places not under the hoe, though a good plant. The sheep are large Leicesters, and pretty well bred; the cattle shorthorns, but rather small in character: we saw no good animals in the fields. The district between the rail and the river Trent appeared good and fruitful, and some good dairies are evidently kept along our route. We soon passed into Yorkshire, and found ourselves amidst lime pits and lime burnings, and on to Doncaster, the country almost as flat as the fens, but rich and fertile, and better farmed. We were disappointed in not observing more barley fields, in accordance with our expectations. The wheats still looking too thin, and are backward. Cattle and sheep not varying much in general features from those just named. As we approached Leeds, the character of the country bordering on the line becomes more mining and manufacturing than agricultural, and continues more or less so till we approach Lancaster. The many dairies require that much of the land should be appropriated to the growth of hay, which appears *only* to be made after the foot cock and small cock principle—no tedding, some made by hand. The district near Lancaster, in the east, appears to be imperfectly drained, and the farming antiquated; neither cattle nor sheep at all improved in character. Shortly after we leave Lancaster the country begins to improve, and as we approach to Kendal we observe many very useful shorthorns and Leicester sheep of fair make, as also some very tolerable farming. At Kendal we get into the mountain and lake district. The Leicester sheep are superseded by the mountain sheep; these are mostly Herdwicks. They are really of a much more profitable character than we had imagined them to be, and are very numerous throughout the whole district: we were right glad to find them so well encouraged in the prize list of the Society. There are many varieties of them evidently, and some direct cross breeds, but we observed many flocks of well-formed, thriving, active little animals, exceedingly well adapted to the district: we hope to see many specimens of the breed in the show yard. It was shearing time, and it

was not a little amusing to us to see the mode of operation. The shearer, or "clipper," sits upon the end of a stool, upon the other end of which, or on his knee, the sheep is placed, which he turns over and about as required, as he proceeds, his business being to shear off the wool of the past year's growth (averaging from 3 to 4lbs. weight), leaving the portion of spring growth on the animal for future warmth. The carcase thereof will weigh, when fat, from 10 to 12lbs. per qr. The cattle are universally shorthorns, rather small, but well shaped. The country is nearly all under pasture, and is devoted to the depasturing of sheep and the purposes of the dairy: the cows rather small, but good milkers. We passed over much of its singular beauties; every spot in the mountains accessible to these little useful sheep is well grazed; but some of the valleys upon which the cows and cattle are depastured are rough and uneven, and might be readily improved in many cases by better drainage. We left Keswick for Carlisle *viâ* Penrith. The first few miles are through the mountain district, having a broad valley on our left. A few oats are grown in this mountain district, but scarcely any wheat, the climate being too wet and cold for bringing it to profitable maturity. We soon found ourselves on Hutton Moor: why it and similar districts are left in this unprofitable state we could not conceive. They have a fair staple soil, and though elevated could grow good oats, potatoes, and artificial grasses. As we proceeded, our ideas of Cumberland farming did not by any means improve: we hope the Society's efforts will lead to better management. We scarcely saw any farming done to our mind between Keswick *viâ* Penrith to Carlisle. Oats, wheat, and fallows, with occasional fields of seeds and turnips, were to be seen, but under what rotation was quite bewildering: the land or stetches in all cases (and even when under seeds) being narrow, with deep bare furrows, no drilling, all broadcast, and not a good crop to be seen. These Cumberland farmers must take a lesson in drilling, at all events. What is to prevent drilling? Nothing that we could perceive. It is the precursor of good husbandry. The sheep are Leicesters, but too long in body, thin in neck, and wool narrow in staple. The ewes appear to be good sucklers; we passed many fine lambs. The cattle are very useful shorthorns. Dairies appear to abound; and much milk is consumed in Carlisle, if we may judge from the number of vendors about the streets, with their pannier-like casks astride their donkeys and horses, as well as carts.

From a first glance at the map, we might suppose that the Agricultural Society is this year holding its Meeting in a corner, Carlisle being within a few miles of the Solway and the Scottish border; but if at Liverpool, Bristol, and other maritime places, we have had successful meetings, as well as at Oxford, Derby, Northampton, York, and other inland towns, we need not fear any falling short of company or interest on the present occasion. Indeed, the experience of the Newcastle Show warrants our expectation of a great gathering of agriculturists at Carlisle; for here, as there, the crowd of travelled "southerners" will be met by thousands of Highland and Lowland plaids, and borderers from beyond the Tweed. In these days of railwaying, it is not the contiguous district so much as the outlying zone of country possessing ready means of transit, that furnishes the company on these occasions; and by opening our *Bradshaw* we find that Carlisle is the focus to which five great lines of railway converge. The three central trunks of communication from the south—viz., the North Western, Midland, and Great Northern Railways—will bring a throng of visitors, taking up on the way sightseers from the vast Manchester and West Riding factory districts; all uniting at Lancaster in immense trains bound for Carlisle. Yorkshire, Durham, and Northumberland will send in their rural population by the Newcastle and Carlisle Railway; and West Cumberland will contribute hosts of farmers and shepherds by the line connecting the seaports along its coast. Then the two great lines from Scotland—the Caledonian and the Glasgow and South Western—will pour down their swarms of canny farmers from Fife and the Lothians, from Dumfries and Ayr, to see what the "sassenachs" are able to show them. And when to all these we add the steam-packet cargoes of visitors from Wigton, Kirkcudbright—from Ulster and Belfast—from the independent Isle of Man—we look forward with enhanced expectation to the spectacle of the week, scarcely marvelling at the prices asked for Carlisle lodgings.

The district especially chosen by the Society for mutual benefit and enlightenment embraces Lancashire, Westmoreland, Cumberland, and the Isle of Man; and we may add, that Durham and Northumberland, though included in the district of the Newcastle meeting, will be again well represented at the present Show, both in the stands and among the ranks of the spectators.

Lancashire, sufficiently celebrated for wheels and spindles, has never claimed consideration as an agricultural county. But, for all that, it has accomplished great things—from the grazing of lofty fells and the difficult culture of mountain valleys, to the drainage of deep mosses and the reclaiming of marshes from the tide; and it possesses some fine tracts of well-cultivated land.

Westmoreland is divided into two unequal portions—one abounding with hills, interspersed with

agricultural valleys; the other being mountainous, wild, bleak, and barren. Half a century ago scarcely one-quarter of the whole county was under cultivation; and the parts now productive are chiefly applied to the growth of oats, the proportion of wheat and barley being very small. Some of the mountains yield a good pasturage for the "fell" sheep, as well as grouse; and herds of cattle graze upon the hills. In the richly-watered vales dairying is pursued to great advantage; and very fine butter is there made. Everybody, too, knows the delicacy of Westmoreland hams.

In *Northumberland*, the moors and mountains occupy nearly one-third of the surface; the north-east division is a land of smoky collieries, and the south-west a dreary barren tract, very wealthy in lead mines. The eastern side, however, is fertile; and there the stranger may find specimens of the famous Northumbrian husbandry, and if he likes may take lessons in the management of farm labourers, by the no less celebrated "hind" system. On the Chevost hills, in the northern angle of the county, are the flocks of peculiar mountain sheep, well known by that name.

Durham is naked and mountainous, particularly in its western angle; but the eastern and central parts include some fertile and beautiful valleys, abounding in good land, where wheat, barley, oats, and peas, alternate with rich pasturage. This county can show other notable things besides its coals—that is to say, its celebrated breed of cattle, remarkable for their symmetrical form, quickness of fattening, and also value for the dairy. The valley of the Tees is justly in repute with breeders of live stock.

The Isle of Man we need not say much about; but we recommend those of our readers who may only know that it has a town called Douglas, a mountain named Snea-fell, a dialect named "Manx," and that its cats have no tails, to go over for a trip just to see what farming they will find there.

We come now to *Cumberland*, in the chief city of which county the meeting is being held. A large portion of the surface consists of lakes and mountains in wild or beautiful succession; and here mountain grazing and vale dairying form almost the only possible agriculture. But there are extensive districts of arable and pasture land, more or less productive, though in few places noted for excellence of cultivation. The railway traveller has no difficulty in detecting the absence of good under-drainage, and the want of good implements. Iron ploughs, thrashing machines, steam engines, and even corn drills, are new in this county; and we caution our friends against being deceived, by the fair and clean cultivation they may observe on their railway passage, into the belief that the fields in general are not so carelessly weeded as people report: thistles, and still more wicked weeds, are too often allowed (forgive the pun) to *cumber land*. Turnip culture is spreading; but one of the worst items of management is, that for want of a more spirited prosecution of drainage, bare fallows are in numberless cases persevered with, where green crops might otherwise profitably replace them. Yet there is much for the southern farmer to learn in Cumberland. What good dairy people they are in those secluded dales! how well they get their hay on the low moist meadows, in spite of mountain storms! and how carefully they store it under cover of wooden roofs erected for the purpose! And then their digging up of rocks, and their transforming of peaty patches into fields and gardens so that rows of turnips, and potatoes, and lands of oats are seen climbing and adorning the steep hill-sides—tell us how to combat the greatest difficulties of soil and climate.

The farms in Cumberland are generally small; although the sheep-walks sometimes embrace several thousands of acres each. Among the numerous occupiers of 40 to 100 acres are included the well-known "estatesmen," or "lairds" as they are called in some parishes. This independent race of yeomen has been greatly valued as the stay of the country, in generations gone by; and their sons and daughters, well trained to industrious and moral habits at home, have gone forth from their native vales, successfully making their way into large commercial businesses and high professions, and help, in a large measure, to form the sterling character of populations found in all parts of the world to which Englishmen emigrate. There are many small tenants of from 10 to 20 or 30 acres, in the neighbourhood of the collieries and iron-mines; and a less numerous class of occupiers of from 150 to 400 or 500 acres, consisting of both tenants and yeomen proprietors, may farm about half the arable-land in the county.

Leases, though now more prevalent than formerly, are by no means general; but agreements and stipulations as to management are customary. Cumberland is not a wheat-growing county: that sown is usually after bare fallow, or, to a less extent, after turnips—yielding on an average about 24 bushels per acre. Oats generally compose half the grain crops of the farm; and their produce is extensively ground into meal, which, made into porridge or cake, constitutes with milk and cheese the breakfast and supper of most farm-households. Turnip-growing has not been a universal part of the farm management until the last twenty-five years, and on the heavier soils is delayed until a more complete drainage is carried out. The southern farmer can hardly appreciate the advantage of such

an improvement, in a district where the rain-fall is double that in his own neighbourhood; and this should be allowed for, by agricultural critics who find no difficulty in cleaning and preparing their dry ground either in autumn or in spring.

In Cumberland we have a fine opportunity for gathering a knowledge of the effect of an extreme climate upon crops and husbandry; and we may study also the degree in which aspect and elevation affect the interests of the husbandman. The surface of the county having a general slope to the west and north-west, the rays of the sun do not communicate so much heat as to a district facing the south. This circumstance, taken in connexion with the excessive rain-fall, the tremendous storms, and long snow-blasts, determines the peculiar adaptation of the country to green crops and grass; its unfavourableness to the growth of cereals, and complete unsuitableness for ripening beans and peas.

The farmer, now-a-days, is supposed to have his eyes open to other objects beside light and heavy crops, couchy fallows, or thistly pastures; so, beside noticing the long scythes for mowing the grass, and the absence of haymaking machines for tedding it; beside observing the queer-looking Leicester or Cheviot-and-Leicester sheep; beside admiring the general run of Durham cattle and excellent milch cows—he may speculate, on his journey, upon the influence of mountains, moors, and woodlands, of lakes and impetuous rivers, in forming the agriculture of the district: or he may geologize a little, watching the successive strata by the railway as he approaches the district, the bleak hills of clay-slate and millstone-grit, and the green valleys of new red sandstone. Either going or returning from Carlisle, we hope that thousands will avail themselves of the opportunity for a tour of relaxation as well as of inquiry and learning. The farmer may visit the Netherby estate, ten miles north of the city, where Sir James Graham has done so much in agricultural improvements; or he may make a further trip to inspect the marvellous Ayrshire ryegrass and hose-pipe manurings. But we hold that an intelligent man ought to educate his taste as well as fund information for his business; and if at Lincoln, last year, there were only flat fens to give singularity to the locality, here we have the romantic lake scenery—and who will not long to approach nearer to that Skiddaw whose dim summit he perceives from the streets of Carlisle? Our advice is, by all means lose yourself for awhile amid the rugged fells and beauteous vales—boat on the glassy bosom of those lakes, and search out the foaming cataracts among rocks and hanging woods; and if you are afraid of getting too far from your vocation, remember that you may there visit the quaint abodes of patriarchal farmers—see the inaccessible flocks shepherded by the most wonderful of dogs; and, if you please, amuse yourself with watching the customs of the pastoral inhabitants.

The city of Carlisle itself possesses considerable interest, as being one of the most ancient in England, existing, some say, in the time of the Britons, but certainly under the Romans, and called by the Saxons *Caer-luel*; whence its present name. Whether arriving by the Lancaster, Newcastle, Maryport, or Caledonian railway, we enter the city between the two court-houses, the castellated towers of which stand as if to guard the entrance of this once-walled and embattled stronghold. These strong circular towers are all that now remains of the old citadel erected by Henry VIII. In the middle of the street, between the courts, is a fine statue of the Earl of Lonsdale, forming a striking ornament to the place. Passing along English-street, we come to the Town Hall, where three other streets diverge, viz., Scotch-street (the best in the city) and Fisher-street, both conducting towards the Show-yard; and Castle-street, leading past the cathedral to the castle.

The cathedral—founded by William II., and completed by Henry I.—is not a very imposing structure, but contains some fine specimens of the Norman and Early English styles of architecture; and the decorative geometrical and flowing tracery. Besides that, its great east window is said to be the finest decorated window in the kingdom. The massive tower of the Castle is a prominent feature in any prospect of the city. The Castle was built by William Rufus; and among its governors have been, John Baliol, afterwards King of Scotland; Robert Bruce, father of the Scottish King; Percy, surnamed Hotspur; and the Duke of Gloucester, afterwards Richard III. In the year 1568 this fortress was the temporary refuge or prison of Mary Queen of Scots.

The approach to the show yard—situated north-west of the castle, upon a meadow called the Sauceries, on the bank of the Eden—is unfortunately narrow, crooked, and inconvenient; although a new road has been constructed, and new gates erected, with a view of facilitating the traffic of vehicles and foot passengers.

For the conveyance of implements and live stock to and from the show yard, a siding has been made from the Caledonian Railway, which runs close outside the Society's boarded inclosure; and busy enough the railway people have been, unloading waggons by means of the cranes purposely erected, and getting the show machinery into its proper stands.

Triumphal arches have been erected by Mr. Clarke, the architect from Gloucester, who has been

appointed to carry out the decoration of the town; and in addition to these grand devices, we suppose that every main street will be verdant with evergreens, and blazing with flags, banners, and ornamental designs.

The Great Floral and Horticultural Exhibition will attract a large concourse of beauty and fashion; and what with balls and concerts, there seems an ample promise of diversion for holiday-folk.

After heavy downfall, the river Eden, like other streams rising in a mountain district, very quickly overflows its banks; and as the Royal Agricultural Society has established its show upon the very meadow often flooded by its waters, it is a matter of satisfaction to know that the space occupied by the yard has been duly surrounded by embankments purposely for this occasion. Our friends may therefore crowd the enclosure in safety from drowning; and, however continuously the rain may pour down upon us, exhibiters need not fear to meet their cattle swimming away from the scene. But the weather threatens at least to develope the advantage of umbrellas and goloshes.

On arriving at the trial yard, on Thursday, we found the usual arrangement of sheds for the thrashing-machines, for covering the corn in sheaf stacked ready for the day, and for sheltering the apparatus by which the various machinery is tested, while a reservoir for supplying water to the engines stands in the centre of the area. The fixed steam-engines are tried singly in succession, with steam from the Society's boiler, which is made to traverse a tramway so as to be connected with each in turn. The portable engines are tested two at a time; and as some hours are occupied by each one, the operation is necessarily a tedious business.

The company assembled was not large, consisting chiefly of exhibiters and the various well-known gentlemen connected with the Society, some being very active in watching the proceedings, "timing" the engines, and, with their note-books and calculations, checking any possible errors on the part of the judges. Most of the well-known faces of our great engine-makers were there. Mr. Amos appeared at home among wheels and mechanism, and Mr. Appold was busy superintending the "breaks." Testing the power and efficiency of steam-engines is the business of mechanics and engineers rather than of agriculturists; but as farmers have to purchase these engines, guided in a great measure by the judges' decision upon the respective merits, it is fitting that farmers should understand the grounds on which the umpires found their opinion. In the first place, the exhibiters have to state in writing full particulars of all the important parts of their engines, not only as to dimensions, strength, and quality of material, but also the number of horse-power each engine is calculated to work at, the time required to generate the steam (taking water at 60 deg.) and raise it up to the working pressure (which is not allowed by the society to exceed 45lbs. per square inch), the quantity of fuel it will consume in getting up the steam, and the consumption of fuel for every hour it is in full work. All these points, as stated by the exhibiters, are tested by actual examination and experiment; and in addition, the judges in adjudicating have to make reference to price, simplicity of construction, the means provided for easy access to the working parts, economy of fuel, and to the portability of the engine (if a portable one), without losing sight of the strength required for safety, and which is best secured by the free use of wrought-iron instead of cast. The power of the engines is first calculated in the usual way, and they are then tested by means of a force-resister, known as a "friction-break." This machine measures and records the amount of power given out by the engine from a certain weight of fuel. As the competing engines are of different powers, from four to eight horses each, in order that all may work under equal conditions, a certain number of pounds of coal for every alleged horse-power is furnished to the fireman, and the resistance of the break is also proportioned to the same nominal horse-power of the engine, the result of the trial giving the amount of work done from the quantity of coal, and the proportion of coal for every *true* horse-power per hour consumed by the different engines. Of course other regulations as to clearing out the fire-box after getting up steam and other matters must be carefully attended to, so that all may start under fair and equal conditions. A mechanical horse-power is always reckoned as able to raise 33,000lbs. one foot per minute; that is, one horse-power will wind at this rate upon a drum a rope to which such a weight is suspended. If, instead of attaching the rope to the drum, we surround the latter with a hoop or break, hang the rope to the hoop, and nip the latter just so tightly that the drum in revolving lifts the weighted rope half way up its periphery, or level with its axis, it is evident that the drum by its rotation may thus *sustain* the weight in the air, revolving without winding up the rope, but exerting precisely the same power as if it did. This is the principle of the friction-break, which tries the ability of the steam-engine to lift a weight, without the inconvenience (amounting to a practical impossibility) of raising it by a rope. The engine has to drive a break-wheel having a certain amount of weight upon it, resisting its rotation; and the amount of work done is told by the number of revolutions of the break-wheel—which constitutes the "duty" the engine can per-

form with a certain quantity of coal. As the friction of the break upon the wheel is but little influenced by the velocity, fluctuations in speed do not affect the final result: if the engine turn the wheel rapidly, it will be by consuming coal more quickly; and if at a low velocity, the fuel may be spun out the longer; but, in either case, only the same number of revolutions will have been made. To register these, therefore, a clock-work index is attached to the axis of the break-wheel. It being necessary that the weight on the break should always hang exactly half-way up the wheel, and as there is a liability of its either sinking too low or being carried round over the wheel, the hoop of the break requires continual alterations of its tightness or pressure upon the wheel. This is commonly done by means of an adjusting screw, which a man is stationed to watch and regulate. Last year, however, Messrs. Ransomes furnished a self-compensating friction-break, which saved much trouble; and at the present trials there is a new form of the machine, the principle of which was first brought out by Mr. Appold several years ago, in connexion with a manual crank-machine in a House-of-Correction, and has been ingeniously applied by Mr. Amos to the friction-break. The principle consists in cutting the band or hoop of the break, and attaching the two ends to different points of a short lever, which when vibrating upon its fulcrum slightly tightens or relaxes the hoop by its differential action—the position of this lever being regulated by the rising or falling of the weight hung to the break.

While the trials of steam-engines were proceeding, the company amused themselves with inspecting the various thrashing and other machines brought into the yard for the next day's trial; the more prominent objects being Usher's steam-plough, and Boydell's engine mounted with his "endless railway," which traversed round and round, backing, stopping short, or running without hesitation or inconvenience over steep hills and logs of timber, sometimes with only one wheel on an elevation, as though the whole machine were about to capsize, and sometimes going up or down inclines without any apparent regard to steepness or irregularity of road.

During Thursday and Friday the trials of both fixed and portable engines were completed—the former being supplied with steam from the Society's boiler, manufactured by Mr. Batley, of Northampton. Nine fixed engines have been tried in the following order:—(Messrs. Hornsby's engine was entered, but did not make its appearance)—Barrett, Exall, and Andrews; Clayton, Shuttleworth, and Co.; Dray and Co.; Holmes and Son; E. B. Johnson; Ransomes and Sims; J. Gray and Co., of Glasgow; Smith Brothers, of Glasgow; and Tuxford and Sons. The portable-engines were tried as follows:—Crosskill; Ransomes and Sims; Clayton and Shuttleworth; Garrett and Co.,; Tuxford and Sons; Boydell and Glazier; Barrett Exall, and Andrewes; J. Lee, of Walsall; and Hornsby. The Judges are Mr. Wm. Owen, of Rotherham, and Mr. J. V. Gooch, C.E., Engineer to the Eastern Counties Railway Company.

On Friday, the trial of several combined portable thrashing machines was accomplished, beginning with Garrett's, Humphries', Barrett's, &c. These were driven by one of Hornsby's engines; each having two trials—once with wheat, and again with barley. A hundred sheaves being served to the machine, a dynamometer measures and records the amount of power transmitted from the engine to the machine; a clock notes the time occupied in thrashing the corn; while the judges (Messrs. Caldwell and Blackett) examine and determine the quality of the work performed. The dynamometer employed is Mr. Amos's ingenious piece of mechanism, which accurately registers the draught and speed of the strap driving the machine.

In the afternoon, the capabilities of Ainslie's brick-making machine were developed, being driven by Messrs. Tuxfords' new portable eight-horse engine. The novelty in this machine consists of a new pug-mill in combination with the rollers of this maker's tile-machine. By simple pressure between two rollers, the clay (beautifully fine for the operation) was forced through a mahogany die, in a continuous rectangular mass, having the section of the length and breadth of a brick; and the rollers were stopped at intervals (by being thrown out of gear with the wheels of the pug-mill), when it was required to cut the piece of clay across into separate bricks—this being done by a frame of wires in the usual way.

The hand chaff-cutters were tested by Amos's dynamometer constructed for crank machines. This clever apparatus measures every variation of strain upon the bearing of a wheel by which the power is transmitted—a pendulum guiding the workmen as to their speed of turning. Each box is filled with the *barley*-straw to be cut, and after a certain number of revolutions, the chaff is weighed and its quality examined by the judges, who in this department are Messrs. Nalder and John Clarke. There were nine tried in the following order:—Crosskill, Garrett, Williams, Hill and Smith, Smith and Ashby, Richmond and Chandler, Cornes, Carson, and Ransome and Sims.

A commencement of the field trials was also made on the afternoon of Friday, at Drawdykes Farm, two miles north-east of the city—the implements being horse-hoes, the judges Messrs. Grain-

ger and Read. Five-and-twenty teams have been engaged for work; and on Tuesday, we believe all the yard judges, stewards, officials, exhibitors, and visitors, are to have a grand field day with the three steam cultivators which are expected to show themselves.

The *Field* trials began on Friday afternoon with the horse-hoes, of which were several for flat work, and Martin's and Huckvale's for setting-out turnips. In accordance with the recommendation of some practical agriculturists last year, Huckvale's admirable and ingenious implement has been adapted for two ridges or drills, instead of only one at a time—the horse being now able to walk between instead of *upon* the rows of plants.

On Saturday morning began the trials of drills, including those "for general purposes," "corn and seed," and seed and manure drills "for small occupations," and turnip drills for "ridge" and "flat" —the judges being Messrs. Granger and Read. The first tried were Garrett's drill, fitted with Chambers' patent manure-distributor, in which there is a very pretty contrivance of lever-scrapers to clean the revolving barrel; and Hornsby's drill, with its well-known india-rubber tubes, and ready means of regulating the feed of seed or manure. This machine has also a lever, which instantaneously throws the "potterer" in or out of gear, by sliding an interposed wheel sideways upon its axis. There were upwards of fifteen drills in the field, including drill barrows, broadcast sowing machines, &c.; among which we noticed both Garrett's and Hornsby's fore-carriage steerage, the latter maker's drill being constructed on his patent principle of gearing from the middle of the box underneath, so that it may be adjusted always horizontal upon the side of a hill.

The piece of land allotted to the broadsharing or scarifying implements, was a very rough, unlevel, two-years' lea, upon a stiff strong soil, very different from the "light land" which the exhibitors had been given to expect. It was also in small three-yard lands, with high ridges and deep furrows, and covered with long coarse herbage. Four stout fresh horses were first attached to Coleman's scarifier; but the noise and bustle of so many people, their being unused to pull alongside each other, and the rattling of the heavy iron whippletrees against their heels, so annoyed the animals that no fair drawing of the implement was possible. Ransome's Biddell scarifier was in the same predicament; and, in both cases, there were continual stoppages and choking of the implement, owing to the rate at which the team pushed on: at one time a stout wooden whippletree snapped asunder like a stick. Crosskill's Ducie-drag was broken on its way to the field; and no person appearing on behalf of Hill's paring-plough, there remained only Bentall's broadshare to stand the almost unwarantable test to which all the implements were subjected. This maker had brought up his light-soil instead of his stronger implement; and doubts were expressed as to whether it would be able to sustain the strain. With one or two alterations after starting, however, it swam through its work in excellent style, Mr. Bentall holding it himself, and sometimes letting it go alone; while the horses, in spite of their drivers, stepped along at the rate of four or five miles an hour. In spite of all the disadvantages under which the trials were made, this implement succeeded in executing its work properly, and with perceptibly greater ease to the horses than in the case of the former scarifiers, which, indeed, proved unable to pare here, however well they might have performed at a more regular pace and on smoother ground.

These implements were next tried as grubbers or cultivators on a portion of the land that had been purposely ploughed; and after them came the various harrows, including Williams', Howard's, Bentall's, and a novelty in the shape of a *vibrating* harrow, hung in a frame and shaken transversely as it proceeded by a crank and levers. Both Williams's and Howard's harrows were remarked as working exceedingly well, being strongly made, and the teeth so inserted as to be incapable of shaking loose. Howard's are jointed longitudinally, so as to be fitted round a ridge or furrow. For simplicity, strength, and cheapness, Bentall's are very good, the bulls being made of double angle-iron by machinery.

Several clod-crushers, Norwegian harrows, &c., were still waiting, when we left the field, for an opportunity of displaying their abilities. The ploughs, subsoilers, &c., are having their turn this day (Monday); and a field of light upstanding rye falls under the vengeance of the reaping machines either at the same time or on Tuesday.

Saturday's trials in the *Yard* proceeded with thrashing-machines, portable and fixed, chaff-cutters (driven by one of Tuxford and Son's engines), cake-breakers, crushers, grinding-mills, &c. The suggestion made last year by the *Mark Lane Express*, that the straw from the thrashing-machines should be thrashed over again, and the cavings, &c., dressed over again, by machines specially provided, has not been followed out. The trials are conducted in the old way; but certainly it would be a fairer and better plan to make the results as independent as possible of the mere judgment and opinion of men who, though excellent practical judges, cannot be expected to be so infallible as the pound-weight and peck measure.

CATALOGUE OF IMPLEMENTS, &c.,

EXHIBITED AT THE SHOW.

Richmond and Chandler, Salford and Manchester and South John-street, Liverpool, Lancashire.

Four chaff cutting machines (No. 1 A,) price £4 10s.; (No. 3 B,) £7; (No. 4 B,) £10; (No. 5,) fitted with pulley, £15 12s.; three corn crushers, (No. 1,) price £5 5s.; (No. 2,) £6 10s.; (No. 3,) fitted with pulley, £10 10s.; two grain and linseed crushers, (No. 2,) price £6 10s.; (No. 4,) fitted with pulley, £14 15s.; a root washer, price £4 4s.; and an improved steaming apparatus, price £6 9s., all invented, improved, and manufactured by the exhibiters; a patent sack holder, price £1 3s., invented by Henry Gilbert, of London, improved and manufactured by the exhibiters; a patent improved sack holder, price £1 12s., invented by Henry Gilbert, of London, improved by Joshua Cooch, of Harleston, and manufactured by the exhibiters; a patent turnip cutter, price £4 10s., invented and improved by Edmund Moody, late of Maiden Bradley, manufactured by R. Samuelson, of Banbury; and a litter cutting machine (new implement), price £7, invented, improved, and manufactured by the exhibiters.

William Coulson, 36, Fetter-lane, York.

A patent combined machine for boring and mortising naves, felloes, gates, posts, &c. (new implement), price £27, invented and manufactured by the exhibiter.

James D. Ferguson, of Bywell, near Newcastle-upon-Tyne.

A ventilator for stables and cowhouses, &c., with air drains and damper for the regulation of fresh air into the building (new implement), price, according to size, £2 to £3, invented by the exhibiter, and manufactured by William Arkle, of Bywell.

Thomas Bigg, of Leicester House, Great Dover-street, Southwark, Surrey.

Three sheep dipping apparatus (These apparatus have obtained premiums and medals from the Highland, Royal Irish, and Yorkshire Agricultural Societies), price £5 to £3, in sizes, invented, improved, and manufactured by the exhibiter.

Robert Tinkler, of Penrith, Cumberland.

A barrel churn, price £4, invented, improved, and manufactured by the exhibiter.

Benjamin Greening and Co., of 1 and 3, Church Gates, Manchester, Lancashire.

Three strained specimens of portable wire fencing (new implements), price 1s. to 1s. 9d. per lineal yard in the roll, manufactured by patent machinery, invented by Benjamin Greening, of Manchester, and manufactured by the exhibiters; a specimen of wire fencing for protecting hedges (new implement), price 8d. per lineal yard, invented by Richard Elleston, Esq., of Lantysilio Hall, Langollen, improved by Benjamin Greening, of Manchester, and manufactured by the exhibiters; a specimen of patent wire hare and rabbit-proof fencing (new implement), price 9d. per lineal yard, or galvanized 1s. 1½d.; and a specimen of patent fencing (new implement), price 2s. 6d. per lineal yard, six feet high, invented by Benjamin Greening, of Manchester, and manufactured by the exhibiters; two tree guards, economical application of patent wire fencing, price, including bolts and nuts for fixing, 12s. 6d. and 8s. 6d. each; and an assortment of plant guards, price 1s. to 3s. each, galvanized 1s. 6d. to 4s. 6d. each, improved by Benjamin Greening, and manufactured by the exhibiters; a circular sweet-pea trainer (new implement), price 5s. 6d., invented by Benjamin Greening, and manufactured by the exhibiters; ornamental garden bordering, price 10d. to 1s. 6d. per yard; and a pea trainer, price 2s. to 2s. 6d. per yard, manufactured by the exhibiters; a portable poultry show-pen (new implement), price 5s. 6d. each, invented by Mr. Jessop, of Cheltenham, improved by Benjamin Greening, and manufactured by the exhibiters; a galvanized portable hen coop, price 10s. 6d. each, improved by Benjamin Greening, and manufactured by the exhibiters; a galvanized hen coop, price 10s. 6d. each, zinc top 2s. 6d. extra, manufactured by the exhibiters; poultry, game, and rabbit-proof wire netting, price, black, 4½d. to 11½d., galvanized 6d. to 1s. 6d. per lineal yard, manufactured by the exhibiters; an improved premium wrought iron field gate, price, with pillars, £2 11s., without pillars, £1 5s. each; an extra strong improved premium wrought iron field gate, price, with hangings complete for wooden or stone posts, £1 10s. each, with cast iron pillars, £3; and an ornamental extra strong wrought iron gate, price £2, with cast iron pillars, £3 10s., improved by B. Greening, and manufactured by the exhibiters; a pair of wrought iron entrance gates, manufactured by the exhibiters, price £6 6s., or with pillars £10 10s., improved by B. Greening, and manufactured by the exhibiters; two specimens of wrought iron cattle hurdles, price 2s. 4d. and 2s. 10d. per lineal yard; ornamental wrought iron garden hurdling, price 2s. 9d. to 4s. 9d. per lineal yard; and a wrought iron sheep hurdle, price, four bars, 2s., five bars, 2s. 3d. per lineal yard, manufactured by the exhibiters; a combined washing and wringing machine and churn (new implement), price £3 10s., churn and staff extra £1 10s., washing tub and "peggy" 13s. 6d.; and a combined washing, wringing, and mangling machine and churn, price £2 more than the above, both invented by the late Mr. Massey, of Longsight, improved by B. Greening, and manufactured by the exhibiters; a diamond-pattern pea trainer, price 2s. 6d. per lineal yard; a pattern of diamond-pattern trellising wire work for walls, price 4d. per square foot; an assortment of wire work orchidia plant baskets, price 18s. per dozen and upwards; a roll of Gothic garden bordering, price 2s. per yard; a new design in garden chairs (iron and wire work), price 16s. 6d. and 18s. 6d. each; new designs in garden seats, price 7s. 6d. and 30s. each; and an assortment of designs for flower stands, price 8s. 6d. to 30s. each, manufactured by the exhibiters.

Robert and John Reeves, Bratton, near Westbury, Wilts.

A Chandler's patent liquid manure drill, price £28 (the following prizes were awarded by the Royal Agricultural Society of England to this machine: A silver medal at York, 1848; also a prize at Norwich, 1849, and at Exeter, 1850; prize medal at Great Exhibition, 1851; the special prize given by the late P. Pusey, Esq., at Gloucester, 1853, and at Lincoln, 1854; twenty-one other prizes have been awarded to this machine by other local societies); a Chandler's patent liquid manure drill, price £28 10s.; and two Chandler's liquid manure drills (new implements) with Reeve's patent improvement, price £22 16s. and £30 4s. each—all invented by Mr. Thomas Chandler, of Aldbourne, improved and manufactured by the exhibiters.

THOMAS SCRAGG, of Calveley, near Tarporley, Cheshire.

A single action tile machine, price £17 (awarded the prize of £5 at the meeting of the Royal Agricultural Society of Lincoln, 1854); a smaller do., price £15 10s.; and a brick press, price £3 10s.—all invented and manufactured by the exhibiter.

WILLIAM ARCHBOLD, of Horsely, Tyne Side, near Newcastle-upon-Tyne.

An improved corn dressing machine (new implement), price £10, improved and manufactured by the exhibiter.

EDWARD BRAYTON, of Burgh-by-Sands, near Carlisle, Cumberland.

A two-horse swing plough, for light or heavy soils, price £4 5s., improved and manufactured by the exhibiter; and a parallel expanding horse hoe, price £3, invented and manufactured by the exhibiter.

JAMES HAYES, of Elton, near Oundle, Huntingdon.

Three grinding mills, prices £26, £19, and £16 15s.; and a flour dressing machine, price £21—all invented, improved and manufactured by the exhibiter.

ROBERT SEWELL, Longtown, Cumberland.

A single plough, designed for general purposes, price 4*l.* 15s; a Sewell's Netherby plough, a general purpose plough, price 4*l.* 10s.; a drill plough and horse hoe combined, price 4*l.* 4s.; and a drill grubber and horse hoe combined, price 4*l.* 10s., improved and manufactured by the exhibiter; and a roller for strong soils, price 12*l.*, invented by the exhibiter and Wm. Carruchers, farmer, Harnoch Hill, manufactured by the exhibiter.

MESSRS. ASTBURY AND BUSHELL, of Bedford.

A patent universal horse-hoe, price 14*l.*, invented by R. H. Nicholls, Esq., Bedford, improved and manufactured by the exhibiters (awarded the following prizes: At Swaffham, on the 22d of June, 1853, the prize of 3*l.* by the Norfolk Agricultural Association; at Gainsborough, on the 27th of July, 1853, the prize of 2*l.* by the North Lincolnshire Agricultural Association; at Norwich, on the 23d of June, 1854, the prize of 3*l.* by the Norfolk Agricultural Association); two patent wrought iron horse hoes, prices 3*l.* 10s. and 3*l.* 5s., invented, improved, and manufactured by the exhibiters; and two improved wrought iron ploughs, prices 3*l.* 15s. and 4*l.* 4s., invented and manufactured by the exhibiters.

JOHN HOPE, of Rigg, near Gretna, Dumfries.

A wheel plough (new implement), price £5, invented, improved, and manufactured by the exhibiter.

Lord KINNAIRD and J. BURRY, of Rossie Priory, near Inchture, Perth, N. B.

A reaping machine, price £31 10s., invented by Cyrus M'Cormick, of America, improved by Lord Kinnaird, of Rossie Priory, and manufactured by John Burry, of Milnfield-by-Dundee, N. B.

ROBERT ROBY, of Bury St. Edmunds, Suffolk.

A patent corn dressing machine or separator (new implement), price £15, invented by T. C. Bridgeman, of Bury St. Edmunds, improved and manufactured by the exhibiter; a patent corn or malt screen (new implement), price £6, invented, improved, and manufactured by the exhibiter; and a light wrought iron double cylinder barley roller, price £11, manufactured by the exhibiter.

DAVID FISKEN, of Gellyburn, near Auchterarder, Perthshire.

A steam cultivator (new implement), price £80, invented by Messrs. Fisken, of Stamfordham, manufactured by R. Roger, Stockton-on-Tees.

Mrs. ANN GILKERSON, of Carlisle, Cumberland.

A new and improved barrel churn (new implement), price £3 15s., invented and improved by James Rigg, of Carlisle, manufactured by the exhibiter.

RICHARD GARRETT and SON, of Leiston Works, near Saxmundham, Suffolk.

A drill for general purposes, price £47 5s., fore carriage steerage extra £4 4s. (prizes were awarded for this drill at Liverpool, 1841, £10; at Derby, 1843, £30; at Southampton, 1844, £20 and a medal; at Northampton, 1847, £15; at Exeter, 1850, £10; at the Great Exhibition of 1851, included in the award of the great Council medal; and at Gloucester, 1853, £10); a drill for turnips and manure on the flat, price £26 5s. (prizes were awarded for this drill at Cambridge, 1840, £10; at Northampton, 1847, £10; at York, 1848, £10; at the Great Exhibition of 1851, included in the award of the Council medal; and at Gloucester, 1853, £10); a drill for turnips and mangel wurzel, with manure on the ridge, price £24 7s. 6d. (prizes were awarded for this drill at Bristol, 1842, £23; at Northampton, 1847, £10; and at Norwich, 1849, £10); a three row economical seed and manure drill for turnips, &c., with manure, on the flat or ridge, price £14, with extras (prizes were awarded for this drill at Lewes, 1852, £5; at Gloucester, 1853, £5; and at Lincoln, 1854, £5); a Chambers' patent broadcast manure distributor, price £21, invented by Thomas Chambers, jun., of Colkirk Hall, Fakenham (this implement received the prize at Lincoln, in 1854); a patent liquid and manure drill, price £35 10s., invented by W. C. Spooner, Esq., of Eling House, Southampton; a ten row lever corn and seed drill, price £25 15s., fore carriage steerage extra £4 4s. (a prize of £10 was awarded for this implement at Norwich); a seven row lever corn and seed drill, price £17 10s. (a prize of £10 was awarded for this drill at Exeter, in 1850, and of £5 at Lewes, in 1852); a No. 5 Garrett's patent horse hoe, price £21 (prizes were awarded for this implement at Liverpool, 1841, £5; at Bristol, 1842, £10; at Derby, 1843, a medal; at Southampton, 1844, a medal; at Northampton, 1847, a medal; at York, 1848, a medal; at Norwich, 1849, £10; at Exeter, 1850, £10; at the Great Exhibition of 1851, Council medal; at Lewes, 1852, £10; at Gloucester, 1853, £10; and at Lincoln, 1854, £5); a patent revolving horse hoe, price £15, invented by John Martin, of Barmer, near Fakenham (this implement received a prize medal for its merits as a new implement, at Gloucester, 1853); a patent horse hoe and turnip thinner, on the ridge and flat, price £7, with extra side hoes £8, invented by Thomas Huckvale, of Choice Sale, Chipping Norton (a prize of £3 was awarded for this implement in Liverpool, 1841; and at Lincoln of £5, in 1854; a complete set of machinery for thrashing and dressing all kinds of grain, and delivering it into sacks, fit for market, in one operation, price £147 (a silver medal was awarded for this machinery at the Gloucester meeting, 1853; a patent portable combined steam power bolting, thrashing, strawshaking, screening, winnowing, elevating, and avelling apparatus, price £104; a portable combined thrashing and screening machine for steam power, price £66 (the prize of £25 was awarded for this machine at Norwich, 1849; and it was included in the award of the Council medal of the Great Exhibition of 1851); a four horse power open drum thrashing machine, price £61 (this machine obtained the prize of £20 at the Lewes meeting, 1852); an eight horse power portable steam engine, price, complete, £245 (a prize of £50 was awarded for this engine at Norwich, 1849; and it was included in the award of the Council medal of the Great Exhibition of 1851); a seven horse power patent portable steam engine, price complete £235; a circular-saw bench, price, with driving pulley, £25; an improved corn dressing machine, price £12; a corn dressing machine for hand power, price £7 5s.; a rape and linseed cake crusher, for all varieties of cake, price £11 (for this machine the prize of the Society has been awarded two years in succession, as the best machine for all varieties of cake—viz., at Gloucester, 1853; and at Lincoln, 1854); a chaff cutter, for horse or steam power, price £15; a chaff cutter, for hand power, price £4 10s.; a newly invented machine for pulping roots (new implement), price £8 8s.; and a Garrett's improved reaping machine, price £35. Nearly the whole of the above implements are invented by the exhibiters; and all are improved and manufactured by them.

SMITH and ASHBY, of Stamford, Lincolnshire.

A Smith and Ashby's patent improved double-action hay-making machine, on Smith and Ashby's patent wrought iron

wheels, price £15 15s. (first prizes were awarded to this implement at the Royal Agricultural Society's meeting at Newcastle, 1846, £5; at the Great Yorkshire Meeting, 1846, £5 5s.; at the Derbyshire meeting, 1846, £5 5s.; at the Great Yorkshire Meeting, 1847, £5; at York, 1848, the Royal Society's medal; at the Great Yorkshire meeting, 1849, £3 3s.; at Norwich, 1849, the Royal Society's prize of £5; the Royal Society's prize for the best haymaker at Exeter, 1850; the first prize of the North Lincolnshire Society, 1850; ditto, Royal North Lancashire, 1850; ditto, Great Yorkshire, 1850; the prize medal at the Exhibition of All Nations, 1851; first prize of the Bath and West of England Society's meeting at Taunton, 1852; at the Royal Society's meeting at Lewes, 1852, the judges' commendation, no prize being offered that year; the first prize of the Bath and West of England Society at Plymouth, 1853; the prize of the North Lancashire meeting at Blackburn, 1853; the medal of the Royal Society at Gloucester, 1853; the first prize of the Bath and West of England Society at Bath, 1854; commended again by the judges of the Royal Society at Lincoln, 1854, no prize offered; and the first prize of the Highland Agricultural Society at Berwick, 1854); a Smith and Ashby's patent improved horse rake, price £7 10s. (this rake took the prize medal of the Great Exhibition, 1851, and has also taken thirteen prizes from various agricultural societies); a Smith and Ashby's patent improved horse rake, price £9; a Smith and Ashby's patent lever wheel hand rake, price £2; a Smith and Ashby's exhibition prize (No. 3) 13-inch patent safety chaff cutter, price £13 10s.; a Smith and Ashby's (No. 4) 12-inch patent safety two-knife chaff cutter, price £9 10s.; a (No. 4) 12-inch patent safety three-knife chaff cutter (new implement), price £10 10s.; a (No. 5) 10-inch patent safety two-knife chaff cutter, price £7 7s.; a (No. 6) 8½-inch chaff cutter, price £5 10s.; improved horse-power gearworks, price £10 10s.; an improved prize seven-tine cultivator, grubber, or scarifier (No. 1), price £15, raising apparatus £2 extra (the prize medal of the Royal Agricultural Society was awarded to this implement at Newcastle, 1846; the prize of £10 was again awarded to this cultivator at the Royal Society's meeting at Norwich, 1849; at the Great Yorkshire meeting, 1849, £5 5s.; again the prize of £10 at the Royal Agricultural Society's meeting at Exeter, 1850; the prize of £5 at the Great Yorkshire meeting, 1850; the prize of the Royal North Lancashire, 1850; and again £5 at the Great Yorkshire meeting, 1852); an improved registered (No. 1) oil cake mill, price £3 10s.; an improved registered (No. 2) double oil cake mill, price £4 10s.; a patent park or luggage cart, price £13 10s.; and an improved one-horse cart for harvest work and general purposes, price £11 10s., patent tip 10s., raves 30s. extra, invented with two or three exceptions, and all improved and manufactured by the exhibiters.

John Whitney and Co., of 18, Fenchurch Buildings, City, London.

Four corn crushers, price £5 to £10; three grinding mills, price £3 10s., £5, and £14; a flour mill for domestic use, price £7; a flour mill (new implement), price £22; a flour mill (new implement), larger size, dressing machine attached, price £52; all invented, improved, and manufactured by the exhibiters.

Alexis Dussac, of 33, Grove-place, Brompton, London.

A steam cultivator (new implement), price £700, invented by the exhibiter, and manufactured by Messrs. Richard and Thomas Hughes, of the Railway Foundry, Brighton Railway Station, New Cross.

Alfred Crosskill, of Beverley, Yorkshire.

A patent clod crusher, or serrated roller, cash price £16 12s. 6d. (received the prize of £20 and silver medal at Southampton, £10 at Shrewsbury, the special gold medal from the council after the Newcastle meeting, and was included in the award of the great council medal at the Great Exhibition of 1851); a patent clod crusher, or serrated roller (new implement), price £16 12s. 6d.; a patent clod crusher, or serrated roller, for light land, price £12 7s., invented and improved by W. Crosskill, of Beverley, and manufactured by the exhibiter; an improved Norwegian harrow, price £15 15s., improved by W. Crosskill, and manufactured by the exhibiter; a Ducie drag, or Uley cultivator, price £11, steel shares 6s. each extra (received prizes amounting to £45 at various meetings of the Royal Agricultural Society); a two horse grubber, price £5 5s.; an improved haymaker (new implement), price £14 14s.; an improved horse rake, price £7 10s., invented and improved by W. Crosskill, and manufactured by the exhibiter; an improved Bell's reaping machine, price complete £42 (received the £20 prize of the Highland Agricultural Society in 1854, the £20 prize of the Stirling Agricultural Society, and the £15 prize and silver medal of the Royal North Lancashire Society; in 1853, received the £10 prize and gold medal of the Yorkshire Agricultural Society, the £20 prize of the Royal Agricultural Society of England, the £10 prize of the Royal North Lancashire Agricultural Society, and the £40 prize at the great trial at Stirling), invented by the Reverend Patrick Bell, of Carmylie, Scotland, improved by W. Crosskill, and manufactured by the exhibiter; a one horse reaping machine, price £25; an improved pair horse waggon, cash price £27 (received the prize of the Royal Agricultural Society for five successive years); a new pair horse waggon (new implement), price £28 10s.; a Newcastle, or model one horse cart, for general purposes, price complete with shelvings £15 15s., less 5 per cent. for cash (received the prize at the Newcastle meeting of the Royal Agricultural Society, in competition with 42 others); an improved Newcastle cart, price complete with raves £15, less 5 per cent. for cash; a York prize cart, price with curved raves £14 10s., as a plain cart £12 10s., less 5 per cent. for cash (received the prize at York, in 1853, for its simple and novel construction), invented and improved by W. Crosskill, and manufactured by the exhibiter; a light Scotch cart, price £11 8s., manufactured by the exhibiter; a new pattern cart and ladders, price £11 7s. 6d., invented and improved by W. Crosskill, and manufactured by the exhibiter; a light Scotch cart, price £10 9s.; two pairs of patent cart wheels and axles, price £7 17s., and £6 13s.; three pairs of cart wheels and axles, price £5 14s. and upwards, improved by W. Crosskill, and manufactured by the exhibiter; specimens of Crosskill's patent portable farm railway, prices, turn table £5 10s., rails 5s. per yard (received medals from the Royal Agricultural Society at the Norwich and Exeter meetings); two trucks for Crosskill's farm railway, price £5 10s. each; an improved iron liquid manure cart, price with pump and leathern pipe £22 15s., without the pump £17 (received a medal at the Cambridge meeting of the Royal Agricultural Society), invented and improved by W. Crosskill, and manufactured by the exhibiter; an improved iron pump, improved by W. Crosskill, and manufactured by the exhibiter; a sanitary or tumbler cart, price £22 10s., invented by Richard Stratton, of Bristol, improved by W. Crosskill, and manufactured by the exhibiter; a four horse power portable thrashing machine, price £50, carriage for thrashing part £6 extra; a corn dressing machine, price £9; a portable thrashing, shaking, and dressing machine, for steam power, price £95; a six horse power portable steam engine, price £220; a portable corn mill for steam or water power, price £55; a three horse power eccentric mill, price £45, travelling carriage £6 extra; a portable saw mill, price, including saw, £18 10s.; a large sized cake breaker, price £7 10s.; a small sized cake breaker, price £4 10s., improved by W. Crosskill, and manufactured by the exhibiter; a chaff cutting machine, price £12 12s., improved and manufactured by Richmond and Chandler, of Manchester; a chaff cutting machine (new implement), price £7, invented and improved by W. Crosskill, and manufactured by the exhibiter; a small sized hand chaff cutter, price £4, improved by W. Crosskill, and manufactured by the exhibiter; an Archimedean root washer, price £5 10s. (received a silver medal at the York meeting of the Royal Agricultural Society), invented by Captain Carr, improved by W. Crosskill, and manufactured by the exhibiter; a patent fixture pig trough, price £4, invented by W. Torr, Esq., of Aylesby, and manufactured by the exhibiter; a circular iron pig trough, price £1 2s.; a small circular pig trough, price 15s., manufactured by the exhibiter.

Williamson, Brothers, of Stainton, near Kendal, Westmoreland.

A two horse power thrashing machine, with horse work complete, price £28; a three horse power thrashing machine of improved construction, with straw shaker and winnower, price £20; a corn dressing machine or winnower, price £5;

an oilcake breaker, price £3 5s.; two corn crushers with iron frames, price £4 10s. and £6 10s.; a chaff cutter, price £2 15s.; a wrought iron turnip cutter, price £1 5s.; a hay maker, price £3 10s.; a double row turnip and seed drill, price £4 4s.; a registered washing, wringing, and mangling machine, price £5 10s., all improved and manufactured by the exhibiters; a centrifugal pump, price £4; a cheese press, price £2 10s., manufactured by the exhibiters; a turnip and seed drill, price £1 15s., improved and manufactured by the exhibiters.

Hugh Carson, of Warminster, Wilts.

A chaff cutting engine, for steam or horse power, price £12 12s., improved and manufactured by the exhibiter; a chaff cutting machine for hand power, price £5 10s., invented, improved, and manufactured by the exhibiter; three of Moody's patent hand turnip cutters, price £4 10s. each (No. 1 received the prize as the best turnip cutter for sheep, at the meeting of the Bath and West of England Agricultural Society at Taunton, 1852; prize as the best turnip cutter for preparation of food for stock, at the meeting of the same society at Plymouth, 1853; highly commended by the judges of the Royal Agricultural Society of England at Gloucester, 1853, and at Lincoln, 1854), invented by Edmund Moody, late of Maiden Bradley, improved and manufactured by the exhibiter; a single cheese press with double lever, price £2 10s., invented, improved, and manufactured by the exhibiter.

Richard Hornsby & Son, of Spittlegate Iron Works, near Grantham, Lincolnshire.

An eight horse power patent portable steam engine, price £255 (the Council medal was awarded for this engine at the Great Exhibition in Hyde Park, in 1851; also the first prize, £20, as the best and most economical engine exhibited at the meeting of the Royal Agricultural Society of England, held at Lincoln, 1854; £10 at Gloucester, 1853; £10 at Lewes, 1852; £50 at Exeter, 1850; £50 at York, 1848); an eight horse power improved horizontal fixed steam engine, price £230; an improved patent portable combined thrashing, shaking, and dressing machine, price £100; a four horse power improved portable thrashing machine, price £75, with travelling apparatus complete (received the first prize of £10 at the Royal Agricultural Society's meeting at Lincoln, in 1854); a patent corn dressing or winnowing machine, price £230 (the Council medal was awarded to this machine at the Great Exhibition in Hyde Park, in 1851; and it has also received the first prizes from the Royal Agricultural Society of England at their meetings: £5 at Lincoln, 1854; £5 at Gloucester, 1853; £10 at Lewes, 1852; £10 at Exeter, 1850; £10 at Norwich, 1849; £10 at York, 1848; and £3 at Newcastle, 1846); a patent corn dressing or winnowing machine, price £13 10s.; a drilling machine for corn and general purposes, price £10 (this drill received the first prize of £10 from the Royal Agricultural Society of England at Lincoln, 1854; £10 at Lewes, 1852; £15 at Norwich, 1849; £15 at York, 1848; £15 at Newcastle-on-Tyne, 1846; £15 at Shrewsbury, 1845; £10 at Derby, 1843; £30 at Bristol, 1842; and £25 at Liverpool, 1841); an improved cake breaking or crushing machine, price £5 5s.; a double cake breaking or crushing machine, price complete £47 (this machine received the Council medal at the Great Exhibition in Hyde Park, 1851; also the first prize of £5 at the Lewes meeting of the Royal Agricultural Society of England, 1852; of £5 at Shrewsbury, 1845; of £5 at Southampton, 1844; of £5 at Derby, 1843); a patent corn and seed drill on an improved principle, price £30 (this drill received the council medal at the Great Exhibition in 1851; also from the Royal Agricultural Society of England the first prize of £10 at their meeting at Lincoln, 1854; £10 at Gloucester, 1853; £10 at Lewes, 1852; £10 at Exeter, 1850; and also the prize medal for the introduction of the patent India-rubber tubes for conducting the seed to the ground, and for patented improvements in the fore-carriage steerage); an improved patent fore-carriage steerage, price £4 10s.; a patent drill for turnips or mangel wurzel with manure, price £26 10s. (this drill received the first prize of £5 at the meeting of the Royal Agricultural Society of England at Lincoln, 1854; £10 at Lewes, 1852; £10 at Exeter, 1850; £10 at Norwich, 1849; and £10 at Shrewsbury, 1845); a two-row patent ridge drill for turnips and mangel wurzel with manure, price £24 (this drill received the Council medal at the Great Exhibition in 1851; also the first prize of £5 at the meeting of the Royal Agricultural Society of England at Lincoln, 1854; £10 at Gloucester, 1853; £10 at Lewes, 1852; £10 at Exeter, 1850; £10 at Norwich, 1849; £10 at York, 1848; £10 at Shrewsbury, 1845; the prize medal at Derby, 1843; and £10 at Liverpool, 1841; a patent small occupation drill, price £20, all invented, improved, and manufactured by the exhibiters.

Edward Hammond Bentall, of Heybridge, near Maldon, Essex.

A Bentall's patent iron beam broadshare and subsoil plough, price 6*l*. 10s. 6d. (as a pair horse scarifier, a prize of 5*l*. was awarded for this implement at the show of the Royal Agricultural Society, at Exeter, in 1850; as a cultivator, a prize medal was awarded at the Great Exhibition of 1851; as a subsoil plough, a prize medal was awarded at the Great Exhibition of 1851; and a prize of 5*l*., as the best scarifier, at Lincoln, in 1854); two Bentall's patent iron beam light broadshare plough, price 5*l*. 5s. and 6*l*. 6s.; four sets of Bentall's patent harrows (new implements), price 3*l*. 16s. 6d. to 5*l*. 10s.—all invented and manufactured by the exhibiters.

Matthew Gibson and Son, Newcastle-upon-Tyne.

A revolving cultivator or grubber, for cleansing, aërating, and pulverizing the soil, price 22*l*.; a revolving subsoiler, for stirring the subsoil (new implement), price 20*l*., invented by Robert Hall, of Prudhoe, Northumberland, improved by Matthew Gibson; a four horse cultivator or grubber, price 10*l*.; two two-horse cultivators or grubbers, price 6*l*. 10s. and 5*l*. 10s., invented by Matthew Gibson; a horse rake, price 7*l*. 10s., improved by Matthew Gibson; an improved patent Northumberland clod crusher, price 15*l*. 10s. (to this implement was awarded a prize medal at the Exhibition of All Nations, at London, in 1851; it was commended at Gloucester, in 1853, no prize being offered for implements of its kind on that occasion), invented and improved by Matthew Gibson. All the above implements are manufactured by the exhibiters.

James Forster, of Esh, Durham.

A two horse grubber (five tine), scarifier, and ribber, with improved leverage, price as a grubber 5*l*. 5s., supplemental tines for scarifying 1*l*. 7s. 6d., ribbing heads 2*l*. 7s. 6d., invented by John Tenant Shields, of Monkton, Ayrshire, improved by W. Blackett, of Blackburn, and manufactured by the exhibiter; an improved cultivator, grubber, and scarifier, for nine, seven, and five tines, price as a grubber 6*l*. 15s., supplemental sock 1*l*. 5s, invented by John Tenant, of Monkton, improved and manufactured by the exhibiter; an improved five tine two horse cultivator, grubber, scarifier, and ribber, with superior leverage, price as a grubber 4*l*. 15s., supplemental socks 15s.; and a drill hoe and drill grubber, price 2*l*. 15s., invented, improved, and manufactured by the exhibiter.

Barrett, Exall, and Andrewes, of Reading, Berks.

A patent iron chaff cutter, O A (new implement), price 5*l*.; a six horse power portable steam engine, price net cash 210*l*., if with water heater 5*l*. extra (this engine obtained the prize medal of the Great Exhibition of All Nations, and the prize of 20*l*. of the Royal Agricultural Society, at Lewes); an eight horse power horizontal fixed steam engine, price with boiler 200*l*., without boiler 112*l*.; a six horse power steam portable combined thrashing machine, price 88*l*. complete; a patent seven horse power portable combined thrashing, strawshaking, winnowing, and dressing machine (new implement), price 105*l*.; a patent eight horse power fixed combined thrashing, winnowing, blowing, strawshaking, dressing, and finishing machine (new implement), price 95*l*.; a two horse power portable patent thrashing machine and patent safety horse gear, price as a fixture 34*l*. 4s., portable 40*l*. 7s.; and a patent iron chaff cutter, for horse or steam power, marked O F, price 15*l*.—all invented, improved, and manufactured by the exhibiters.

Clayton, Shuttleworth, and Co., of Lincoln.

A six-horse power patent portable steam engine, price 220*l*. (this engine received a prize of 25*l*. at the Royal Agricultural Society's meeting held at Norwich, 1849; 25*l*. at Exeter, 1850; a prize medal at the Great Exhibition of All Nations, 1851; and the first prize of 20*l*. at the Royal Agricultural Society's meeting held at Gloucester, 1853); two eight horse

power patent portable steam engines, price 255*l.* and 260*l.*; two eight-horse power fixed steam engines, price 210*l.* and 215*l.*; a fourteen-horse power fixed steam engine, price 350*l.*; an eight-horse power patent portable steam engine, price 255*l.*; a set of fixed barn works, price 150*l.* (a silver medal and 10*l.* were awarded to this piece of machinery, when exhibited at the Society's meeting held at Lewes, 1852; a silver medal at the Society's meeting at Gloucester, 1853; also 20*l.* at Lincoln, 1854); a combined portable thrashing, straw shaking, riddling, winnowing, chaff separating, and barley horning machine (new implement), price 115*l.*; a combined portable thrashing, straw shaking, riddling, winnowing, chaff separating, and barley horning machine, price complete 95*l.* (this machine was exhibited at the Royal Agricultural Society's meeting held at Lewes, 1852, and had a prize of 20*l.* awarded to it; also 20*l.* at Lincoln, 1854); a pair of portable Derbyshire millstones, driven by steam power, price 48*l.* (this grinding mill received the prize of 10*l.* at the Royal Agricultural Society's meeting held at Norwich, 1849; 10*l.* at Exeter, 1850; 10*l.* at Gloucester, 1853; and 5*l.* at Lincoln, 1854); two portable circular-saw benches, price 15*l.* and 35*l.*; a pair of liquid manure pumps (new implement), price 50*l.*; all invented, improved, and manufactured by the exhibiters.

William Williams, of Bedford.

Three sets of patent four-beam diagonal iron harrows, price 3*l.* 3s., 3*l.* 15s., and 5*l.* 10s.; a set of patent four-beam diagonal iron harrows, price 4*l.* 4s. (these harrows obtained a prize at the meeting of the Royal Agricultural Society at Derby, 1843; at Southampton, 1844; at Shrewsbury, 1845; at Northampton, 1847; at Norwich, 1849; at Exeter, 1850; the prize medal was also awarded to these harrows at the Great Exhibition of 1851; also a prize at Lewes, 1852; at Gloucester, 1853); and a patent horse rake, price 7*l.* 10s. (a prize was awarded to this implement at the meeting of the Royal Agricultural Society at Southampton, 1844; also at Norwich, 1849; and at the Royal Agricultural Society of Ireland meeting at Dublin, 1851); invented by Samuel Taylor of Cotton End, improved and manufactured by the exhibiter; a small chaff engine with two knives, price 3*l.*; a chaff engine with two knives, price 6*l.* 10s.; and a chaff engine with three knives, price 14*l.* 14s.; invented, improved, and manufactured by the exhibiter; a machine for making drain pipes and tiles, price 17*l.* 17s.; invented by Sanders and Williams of Bedford, improved and manufactured by the exhibiter (a prize of 25*l.* was awarded to this machine at the meeting of the Royal Agricultural Society at Northampton, 1847; and at Dublin, 1851; a new patent machine for making bricks, drain pipes, and tiles, price 28*l.*; invented, improved, and manufactured by the exhibiter; a patent universal horse hoe, price 14*l.*; invented by R. H. Nichols of Bedford, and manufactured by the exhibiter; a patent one-row horse hoe, price 3*l.* 10s.; invented by R. H. Nichols of Bedford, improved and manufactured by the exhibiters; a set of improved tressed whipple-trees, price 11s. 6d.; invented by Egerton Harding, Esq., improved and manufactured by the exhibiter, and a set of improved equalizing whipple-trees, price 1*l.* 6s., manufactured by the exhibiter.

William Cambridge, of Bristol.

Eight patent rollers or clod crushers of various widths, price from 21*l.* 5s. to 14*l.*; No. 1 obtained the prize at the meeting of the West of England Agricultural Society at Plymouth, in 1853; and six patent rollers, price 14*l.* 5s. to 10*l.*—all invented, improved, and manufactured by the exhibiter.

William Dray, & Co., of Swan-lane, Upper-Thames Street, London.

An eight horse power fixed steam engine (new implement), price with the exhibiter's patent tubular boiler 240*l.*; and a six horse power fixed steam engine (new implement), price with patent tubular boiler 200*l.* (a prize of 10*l.* was awarded to this engine at the Royal Agricultural Society's meeting held at Lincoln, 1854), invented, improved and manufactured by the exhibiter; three patent reaping machines, price 25*l.* each (one of these machines received the prize of the Royal Agricultural Society at Lincoln, 1854, in addition to those of the Bath and West of England, the Stirling, the Burnley, and North Lancashire, all in 1854; thus gaining every prize for which it competed), invented by Obed Hussey, of the United States, improved and manufactured by the exhibiters; two registered winnowing and blowing machines, prices 10*l.* 10s. and 11*l.* 11s.; a rick stand, price 5*l.* 10s.; a light one horse cart, price 23*l.*; a registered chaff cutting machine, price 3*l.* 3s.; and an improved chaff cutting machine, price 4*l.*, invented, improved, and manufactured by the exhibiters; three improved chaff cutting machines, price 4*l.* 10s., 7*l.*, and 10*l.*, pulley 10s. extra, invented, improved, and manufactured by Richmond and Chandler, of Salford; two patent chaff cutting machines (new implements), price 12*l.* 12s., and 13*l.* 13s.; and an improved corn crusher, price 4*l.* 4s., invented, improved, and manufactured by the exhibiters; two improved corn crushers, price 5*l.* 5s., and 10*l.* 12s.; an improved corn crushing machine, price 6*l.* 10s., and an improved linseed and oat crushing machine, price 6*l.* 10s., invented, improved, and manufactured by Richmond and Chandler, of Salford; three improved grain crushing machines, price 6*l.*, 7*l.*, and 10*l.* 10s.; a portable farm bench and vice, price 2*l.* 10s.; a portable forge for farm use, price 3*l.* 10s.; and a set of forge tools, price 1*l.* 1s., invented, improved, and manufactured by the exhibiters; an improved patent self cleaning lateral toothed grubber, price 5*l.* 15s., invented by J. Tenant of Monkton, improved and manufactured by the exhibiters; an iron subsoil plough, price 6*l.* 15s. (this implement has obtained many prizes at various agricultural shows) invented, improved, and manufactured by Gray and Co., of Uddington; two improved wrought iron screw lifting jacks, price 2*l.* 10s., and 3*l.* 5s.; and iron wheel barrow, price 1*l.* 6s.; two iron manger racks and water troughs, price 3*l.* 16s. each; an enamelled manger, price 1*l.* 2s.; an enamelled corn manger, price 1*l.* 10s.; two iron hayracks, price 8s. 6d. each; and several galvanized iron pails, and painted stable pails, price 4s. 6d, and 5s. 6d. each, invented, improved, and manufactured by the exhibiters; nine American churns, price 1*l.* 10s. to 3*l.* 3s., invented by J. Dalphin, of the United States, improved and manufactured by the exhibiters; twelve steel digging forks, price 4s. 6d. and upwards: three improved dung forks, price 4s. 6d. each; nine improved hay forks, price 3s. 6d. to 4s. 6d. each; and two improved pitching forks, price 5s. 3d., and 5s. 6d., invented, improved, and manufactured by Lyndon, of Sheffield; a patent grain and seed separator (new implement) price 6*l.*, invented by G. B. Salmon, of Illinois, improved and manufactured by the exhibiters; two portable farm fire engines, price 8*l.* 10s. and 9*l.* 10s.; a Wm. Dray and Co's patent tubular iron rick frame, price 10*l.*; a pair of Wm. Dray and Co's patent tubular iron entrance gates, price 4*l.* 15s.; a W. Dray and Co's patent tubular iron hand gate, price 1*l.* 18s.; a W. Dray and Co's patent tubular iron field gate and posts, price 2*l.* 10s.; a W. Dray and Co's patent prize winnowing machine, price 12*l.* 12s., pulley 10s. extra; and an improved patent chaff cutting machine, price 16*l.*, invented, improved, and manufactured by the exhibiters; and five Boyd's patent self-adjusting scythes, price 10s. 6d. each, invented by J. Boyd, of London, improved and manufactured by the exhibiters.

Fowler and Fry, of Bristol.

A break waggon, price 42*l.*, invented by the late Richard Stratton, of Bristol, improved and manufactured by the exhibiters; a registered farm cart, price 15*l.*, invented, improved, and manufactured by the exhibiters; a cobourg, or family cart, price 28*l.*, improved and manufactured by the exhibiters; an oilcake crusher (new implement), price 3*l.* 5s.; a single row seed and manure drill (new implement), price 6*l.* 10s., invented, improved, and manufactured by the exhibiters; two root graters (new implements), price 3*l.* 10s. and 4*l.*, invented by Bushe and Barter, of Lismore, improved and manufactured by the exhibiters; and a drainpipe-making machine, price 35*l.*, invented by Alfred Tuckett, of Siston, improved and manufactured by the exhibiters.

John Geddes, of Chapel Knows, Cannobie, Dumfriesshire.

A turnip drill, for sowing upon the ridges, price 6*l.*; and a two horse grubber, price 3*l.* 10s., improved and manufactured by the exhibiter.

Hill and Smith, of Brierly Hill Iron Works, near Dudley.

A set of improved cast iron stable furniture, price—stall post with top and bottom rail 1*l.* 15s., rack and manger 1*l.* 7s. 6d., extra if manger is enamelled 12s. 6d., improved ventilator

with air brick 12s. 6d., drain and trap 14s., invented, improved, and manufactured by the exhibiters; a patent mowing or cutting machine for lawns, pleasure grounds, bowling greens, &c., price—hand machine for one man, cutting 16 inches wide 5*l.* 10s., ditto for two men, cutting 22 inches 6*l.*, pony or donkey machine cutting 26 inches 8*l.*, horse machine cutting 28 inches 11*l.*, ditto cutting 36 inches 15*l.*, manufactured by the exhibiters; a crane and winch, price 7*l.* 10s. (a premium was awarded to this crane and winch at the Shrewsbury meeting of the Royal Agricultural Society); and a crane and winch, price 10*l.* 10s., invented and manufactured by the exhibiters; two wrought iron skim or pair horse scarifiers, price 5*l.* and 6*l.* (one of these implements obtained the first prize of its class at the Derby meeting), invented, improved, and manufactured by the exhibiters; a registered wrought iron expanding horse hoe, price 3*l.* 3s. (the silver medal of the Royal Agricultural Society was awarded to this implement at the Exeter meeting, and it also obtained a silver medal from the Yorkshire Agricultural Society at Thirsk); a wrought iron expanding horse hoe, price 2*l.* 15s.; a registered wrought iron expanding horse hoe, price 3*l.* 10s.; and a registered horse hoe, price 2*l.* 10s., invented and manufactured by the exhibiters; a rotary screening machine, for screening ashes for manure, sand, gravel, &c., price 6*l.* 16s., manufactured by the exhibiter; a wrought iron barrow, with apparatus for heating gas tar, &c, price 3*l.* 3s.; a wrought iron barrow for general purposes, price 1*l.* 10s., a wrought iron circular rick stand, on cast iron pillars, prices—12 feet diameter with nine pillars 5*l.*, 13 feet diameter with nine pillars 5*l.* 15s., 14 feet diameter with nine pillars 6*l.* 2s. 6d., 15 feet diameter with nine pillars 6*l.* 12s. 6d., 16 feet with eleven pillars 7*l.* 10s., 18 feet with 23 pillars 10*l.* 5s., 20 feet with 23 pillars 11*l.* 10s., 22 feet with 23 pillars 12*l.* 10s.; an oblong rick stand, of wrought iron, on cast iron vermin-proof pillars, price 4*l.* 11s. 6d. to 25*l.* 5s., according to size and number of pillars; an oblong rick stand, on cast iron vermin-proof pillars, with wood top, price of pillar and cap 4s. 3d. each; and a set of rick stand pillars and caps, for large or small ricks, price—nine pillars and caps for 12 feet diameter rick stand 1*l.* 11s. 6d. per set, invented and manufactured by the exhibiters; six Cornes' registered chaff cutters, price 4*l.* 10s. to 12*l.* 10s. (the Royal Agricultural Society has awarded to Mr. Cornes a premium eight years in succession, and to this machine the prize medal of the Great Exhibition was awarded), invented by James Cornes, improved and manufactured by the exhibiters; a wrought iron sheep trough, price 1*l.* 10s., invented and manufactured by the exhibiters; a wrought iron sackholder, price 1*l.* 10s.; and a wrought iron sackholder on wheels, price 1*l.* 12s., invented by Mr. Gilbert, of St. Leonards, improved by Mr. Cooch, of Harleston, and manufactured by the exhibiters; a specimen of game proof wire netting; a length of invisible strained wire ox fence; an assortment of premium continuous iron fences for sheep, cattle, oxen, and deer, at various prices (these fences obtained the silver medal of the Royal Agricultural Society at the Southampton meeting, and also at the Shrewsbury meeting); two ornamental wrought iron garden seats, price 2*l.* 7s. 6d. and 1*l.* 15s.; a set of ornamental game-proof garden hurdles, price 5s. to 6s. 6d. each; a set of ornamental wrought iron game proof cattle hurdles, price 11s. to 8s. 6d. each; a set of strong wrought iron hurdles, price 3s. 8d. to 6s. 6d. each; a strong wrought iron field gate, hung to iron posts, price 2*l.* 12s.; a premium wrought iron field gate, price 2*l.* 10s. (the silver medal of the Royal Agricultural Society was awarded to this gate and posts at the Derby meeting, and the Royal Agricultural Improvement Society of Ireland awarded it the prize they offered for "the best and most economical field gate of any description"); a superior wrought iron entrance gate, with side gates and pillars complete, price 15*l.* 10s.; a pair of wrought iron entrance gates and posts, price 9*l.* 9s.; a wrought iron entrance gate, price 3*l.* 3s.; a wrought iron field gate, price 1*l.* 6s.; a wrought iron ornamental wicket gate, price 3*l.* 3s.; a wrought iron wicket gate, price 3*l.* 15s.; and a wrought iron sheep rack, price 4*l.* 10s., invented and manufactured by the exhibiters; and a specimen of patent black varnish, price 1s. per gallon.

Holmes and Sons, of Prospect-place Works, Norwich.

An eight horse power horizontal fixed steam engine, price 210*l.*; an improved combined portable thrashing machine for steam power (to this machine the first prize medal was awarded with straw shaker), price with one winnower 85*l.*, if with elevators and horner 95*l.*, complete with weighing apparatus 115*l.*; an improved portable cloverseed drawer or sheller for steam power, price 35*l.*, if on wood wheels 5*l.* extra; an improved manure distributor, price 13s. 10s., extra for side hills improvement 1*l.* (this implement was awarded the Royal Agricultural Society's prize at Exeter; it has also had prizes at Taunton, 1852; at Bath, 1854; and at Norwich, 1854); the economical small occupation seed and manure drill for flat or ridge work, price 13*l.* 13s. (prizes have been awarded to this implement at Bath, 1854; at Plymouth, 1853; and at Taunton, 1852); and a small occupation corn drill, price 16*l.*, invented, improved, and manufactured by the exhibiters; a Jeck's patent lawn sweeping machine and collector, price 5*l.* 5s., invented by Isaac Jecks, of Trowse, Newton Lodge, Norwich, improved and manufactured by the exhibiters; a two row hand barrow drilling machine for mangolds or turnips, price 2*l.* 15s.; a one row hand mangold and turnip drilling machine, price 2*l.*; a barley awning machine, price 4*l.* 10s., improved and manufactured by the exhibiters; an improved corn dressing and winnowing machine, price 3*l.* 13s.; and a small occupation corn dressing and winnowing machine, price 5s. 10s., if on carriage wheels 7s. 6d. extra, invented, improved, and manufactured by the exhibiters.

Arthur Lyon, of 32, Windmill-street, Finsbury, Middlesex.

Two pulping machines, price 7*l.* 10s. and 6*l.*, invented, improved, and manufactured by the exhibiter; a cutting machine, price 6*l.* 10s., invented and manufactured by the exhibiter; a cutting machine, price 2*l.* 5s., invented, improved, and manufactured by the exhibiter; a machine for cramming live turkeys and other poultry, price 3*l.* 3s., manufactured by the exhibiter; a cutting machine, price 6*l.* 6s.; and cutting machines of various sizes, prices from 1*l.* 10s. to 3*l.* 10s., invented, improved, and manufactured by the exhibiter.

William Newzam Nicholson, of Newark-upon-Trent, Nottinghamshire.

Two machines for breaking oilcake for beasts and sheep, price 3*l.* 3s. and 4*l.* 4s. (No. 1 had a prize of 5*l.* awarded to it at the Norwich show, and also a prize of 3*l.* at the Gloucester show); a machine for breaking oilcake for beasts and sheep, and rapecakes for tillage, price 5*l.* 5s. (this machine received a prize of 5*l.* at Exeter; the prize medal at the Great Exhibition; and a high commendation at Lincoln last year); a machine for breaking oilcake for beasts and sheep (new implement), price 3*l.* 3s.; two machines for breaking oilcake for beasts and sheep, and rape cake for tillage (new implements), price 5*l.* 5s. and 9*l.* 9s.; a mill for grinding beans, &c., price 4*l.*; and two patent haymaking machines (new implements), price 13*l.* 13s. each, invented, improved, and manufactured by the exhibiter; a one horse cart, price 13*l.*, harvest raves 30s., improved and manufactured by the exhibiter; a complete corn dressing or winnowing machine, combining in one implement an efficient roughing, dressing, and blowing machine, price 12*l.*; a winnowing or corn dressing machine, which may also be used as a blower, price 9*l.* 9s.; a corn dressing, roughing, and blowing machine, for smaller occupations, price 9*l.* 9s.; and a corn dressing machine, for smaller occupations, price 8*l.* 8s., invented, improved, and manufactured by the exhibiter; a barley awing or hummelling, machine, price 5*l.* 10s. and a small two knife chaff cutter, made of iron entirely, price 4*l.*, improved and manufactured by the exhibiter; a one horse power portable steam engine on wheels (new implement), price on wheels 28*l.*, if with spring balance and water gauge, as well as gauge cocks, 30*l.*, felted and lagged 30s. extra, steaming vessels fitted to engine 40s. to 120s. each, chaff engine, 8*l.* to 11*l.*, grain crusher 8*l.* 10s., fitted to steam engine, invented and manufactured by the exhibiter; a one row ridge turnip drill for seed and manure, price 7*l.* 7s., improved and manufactured by the exhibiter; improved tubular iron whippletrees, for two or three horses, price of two horse set 12s. 6d., three horse set 17s. 6d., a series, applicable as three sets of two horses or twosets of three horse whippletrees for 2*l.* 10s., manufactured by the exhibiter; two land rollers, with patent metallic shafts, price 8*l.* and 10*l.* 10s., invented improved, and manufactured by the exhibiter; a pair of machines for washing and wringing, price of the pair 10*l.*, improved and manufactured by the exhibiter; a cottage cooking

grate or range, price 11. 18s. 6d. (had the prize of 5l. awarded at the York show, and prize of 5l. at the Exeter show; and a silver medal at Lincoln show); a cottage cooking range, price complete 3l. 3s.; two cottage cooking grates, price 2l. 10s., and 1l. 13s.; a cooking grate, adapted for a small farm kitchen or bailiff's cottage, price 4l. 4s.; a cooking grate for farm kitchens, price 7l. 10s.; a superior range for farm kitchens, price 11l. 15s.; a cosmopolitan cooking stove, price 6l., invented, improved, and manufactured by the exhibiter.

FREDERICK PHILLIPS, of Brandon, Norfolk, and JAMES WOODS, Stowmarket, Suffolk.

Four patent hand root pulping and mincing machines (new implements), price 6l. 10s. and 7l. 10s. (No. 1 obtained the first prize at the Lincoln Show); and a patent power root pulping and mincing machine, in iron frame, price, fitted for power, 12l. 12s., invented and improved by Frederick Phillips, of Brandon, and manufactured by James Woods, of Stowmarket; a model of a steam apparatus for steaming or cooking straw and other chaff for feeding sheep and cattle (new implement), price according to size, amount of tank room, and requirements of daily consumption, improved by Frederick Phillips, of Brandon, and manufactured by James Woods, of Stowmarket; a registered crushing and grinding mill, price 13l. 13s.; two registered crushing mills for linseed, oats, barley, and malt, price 11l. 11s. and 7l. 15s.; and a registered crushing and grinding mill for crushing linseed, oats, barley, malt, &c., and grinding beans and peas, price 10l. 10s., invented, improved, and manufactured by James Woods, of Stowmarket; a registered crushing and grinding mill, price 5l. 15s.; and a registered crushing mill (new implement), price 4l. 10s., improved and manufactured by James Woods, of Stowmarket; a patent atmospheric land fertilizer and poppy and weed extirpator (new implement), price 7l. 12s. 6d., invented by Frederick Phillips, of Brandon, and manufactured by James Woods, of Stowmarket; a Norfolk scarifier (new implement), price 9l. 10s., improved by Frederick Phillips, of Brandon, and manufactured by James Woods, of Stowmarket; a Gloucester broadshare and cultivator, price 6l. 16s.; and a two horse Suffolk scarifier or skim, price 6l. 10s., improved and manufactured by James Woods, of Stowmarket; a patent cabinet mangle, price 6l. 10s.; and a Halls' patent cabinet mangle, price 6l. 10s., invented by John Halls, of Bedford, and manufactured by James Woods, of Stowmarket; a portable asphalte caldron, with working tools and specimens of asphalte flooring, price of caldron with all working tools complete and directions for use 17l.; and an improved power for one horse, price 13l. 13s., invented, improved, and manufactured by James Woods, of Stowmarket.

WILLIAM PIERCE, of 73, Mark Lane, London, Middlesex.

A patent spring shaft agricultural cart (new implement), price 14l.; a patent spring shaft agricultural harvest cart (new implement), price 16l.; and a patent spring shaft car or chaise cart (new implement), price 40l., invented by the Rev. Frederick Glover, of London, and manufactured by the exhibiter; an improved Hampshire cart, price 13l. 13s.; and a haymaking machine (new implement), price 15l., invented and manufactured by James Woodbourne, of Kingsley, near Alton, Hampshire; a horse rake (new implement), price 7l., invented, improved, and manufactured by James Woodbourne, of Kingsley, near Alton, Hampshire; a patent vitrified churn (new implement), price 2l. 10s., invented and manufactured by Robert Cogan, of 48, Leicester-square, London; a selection of glass articles, price from 1s. to 50s., invented and manufactured by Robert Cogan, of 48, Leicester-square, London; and four bundles of best cast steel digging forks, price from 4s. 6d. to 6s. 6d. each fork, invented and manufactured by Sparks, of Birmingham.

REEVES and SON, of Stanwix, near Carlisle, Cumberland.

A plough best adapted for general purposes, price 4l. 10s.; a grubber or scarifier, price 7l. 10s.; a corn and seed drill, price 7l. 7s.; and a turnip and mangel wurzel drill, price 6l. 10s., all improved and manufactured by the exhibiters.

JOHN RICHARDSON, of Milbourn Cottage, near Carlisle, Cumberland.

Three winnowing machines, prices 6l. 10s., 7l., and 9l., improved and manufactured by the exhibiter.

THOMAS BUXTON, of New Malton, Yorkshire.

A twelve inch steel mill, for grinding, splitting, bruising, and breaking oats, beans, barley, and other descriptions of grain (new implement), price 12l. 12s.; a nine inch steel mill, for splitting, bruising, breaking, and grinding oats, beans, barley, and other descriptions of grain (new implement), price 10l. 10s.; and a five inch steel mill, for splitting, bruising, breaking, and grinding oats, beans, barley, and other descriptions of grain (new implement), price 8l. 8s., invented and manufactured by the exhibiter.

WILLIAM PROCKTER STANLEY, of Peterborough, Northamptonshire.

A Stanley's registered roller mill, for crushing linseed, oats, barley, malt, gold of pleasure, beans, and Indian corn, price 11l. 11s. (prizes were awarded to this mill at the Royal Agricultural shows at York, Exeter, Lewes, Gloucester, and the Judges' highest commendation at Lincoln; Royal Irish Society's shows at Galway and Killarney; at the Bath and West of England Society's show at Plymouth, and also at the following local shows:—Peterborough, Huntingdon, Wisbeach, Boston, Lincoln, North Stafford, North Lancashire, Northumberland, Durham, Cleveland, Brigg, Liverpool, Manchester, Preston, Farnham, and Yorkshire. This well known and highly appreciated machine also obtained the reward of a medal at the Royal Exhibition of 1851); three Stanley's registered roller mills, prices 16l. 10s., 8l., and 6l.; a Stanley's oat, bean, and universal mill, price 4l., if fitted with additional rollers for linseed 1l. extra; a Stanley's registered farmers' steaming apparatus, for cooking hay, chaff, roots, linseed, and other compounds for cattle, price 17l. 10s. (prizes were awarded to this apparatus at the Royal Agricultural Society's shows at York, Exeter, Norwich, Lewes, Gloucester, and Aberdeen; Royal Irish show at Galway and Killarney, Bath and West of England Society's shows at Plymouth, and at the following local shows:—Peterborough, Huntingdon, Wisbeach, Northampton, Boston, North Stafford, Lincoln, Brigg, North Lancashire, Liverpool, Manchester, Northumberland, Durham, Cleveland, South Lancashire); and a Stanley's registered farmer's steaming apparatus, price 35l., invented, improved, and manufactured by the exhibiter; and a Cambridge's patent press wheel roller and clod crusher, price 16l. (a prize of 5l. was awarded to it at Preston for preventing the ravages of the wireworm and slug; a prize at Exminster for rolling pasture or meadow land; ditto at Exeter, for preparing turnip land for barley; at North Lincolnshire, for clod crushing; at Edinburgh, for producing good crops of Swede turnips, &c., and at many other local societies for its general use), invented by Mr. Cambridge, of Bristol, improved and manufactured by the exhibiter.

EDWARD R. and FREDERICK TURNER, of St. Peter's Iron Works, Ipswich, Suffolk.

A Turner's No. 1 roller mill, for crushing, linseed, oats, malt, barley, &c., price 11l. 11s. (obtained the prize of 5l. as the best linseed and corn crusher at the Royal Agricultural Society's meetings at Norwich, 1849; at Gloucester, 1853; and at Lincoln, 1854), invented by Bond, Turner and Hurwood, of Ipswich, improved and manufactured by the exhibiters; a Turner's No. 2 roller mill, for crushing linseed, oats, malt, barley, &c., price 8l.; a Turner's No. 3 roller mill, for crushing linseed, oats, malt, barley, &c., and grinding beans, price 14l. 10s. (this mill obtained the prize of the Bath and West of England Society, at the Bath meeting, 1854, and of the Yorkshire Agricultural Society, at the Ripon meeting, 1854); a Turner's No. 4 roller mill, price 10l. 10s.; a Turner's No. 5 roller mill, for crushing oats, &c., and splitting beans, price 5l. 15s. 6d.; and a Turner's linseed and corn crushing mill, price 42l., invented, improved, and manufactured by the exhibiters; a Turner's patent combined crushing and grinding mill (new implement), price 25l., invented and manufactured by the exhibiters; a Turner's chaff cutter, price 10l. 10s., or if fitted with patent apparatus 11l. 11s. (this machine was awarded the prize of the Yorkshire Agricultural Society, at the Ripon meeting in 1854); a Turner's oilcake breaker for sheep, price 3l. 10s.; a Turner's oilcake breaker for beasts, price 3l. 10s.; and a Turner's hand roller mill for oats and beans, price 5l. 15s. 6d., invented, improved, and manufactured by the exhibiters.

Barnard and Bishop, of Norwich, Norfolk.

A strong wrought iron garden chair, price 1*l.* 7*s.*; a wrought iron garden chair, price 18*s.* 6*d.*; and a strong wrought iron garden seat, price 12*s.* 6*d.*, invented and manufactured by the exhibiters; several wrought iron folding garden stools and garden chairs, price 4*s.* each and upwards, improved and manufactured by the exhibiters; registered poultry troughs and fountains, especially adapted for young chickens, prices 10*s.* to 15*s.*, invented and manufactured by the exhibiters; cast iron troughs for poultry, prices 1*s.* 9*d.* to 2*s.* 9*d.*, improved and manufactured by the exhibiters; circular, demi-circular, triangular, and double cast iron troughs for poultry, price 3*s.* to 8*s.* 6*d.*; circular cast iron troughs for dogs, price 2*s.* 6*d.* and 3*s.* 6*d.*; numerous rolls of light and strong galvanized and japanned wire netting, suitable for poultry, hare and rabbit proof, &c., prices 4½*d.* to 1*s.* 8*d.* per lineal yard; a roll of galvanized wire sheep netting, 36 in. wide, with flexible selvages, price 11*d.* per lineal yard; a roll of heavy galvanized wire sheep netting, 36 in. wide, with flexible selvages, price 1*s.* 4*d.* per lineal yard; a sample of strained wire fencing for horses and heavy cattle, price for straining posts 34*s.* each, for fencing price 1*s.* 9*d.* per lineal yard; a five bar iron hurdle, price 5*s.* 6*d.*; an iron hurdle for cattle or sheep, price 7*s.* 3*d.*; a portable iron hurdle, price 5*s.* 9*d.*; and six poultry hurdles, price 5*s.* 6*d.* each, invented and manufactured by the exhibiters; a wrought iron sheep fold hurdle, on wheels, price 19*s.*, improved and manufactured by the exhibiters; a patent iron sheep fold hurdle, price 14*s.*, one wheel, which is sufficient for each fold, price 10*s.*, invented by Henry Gilbert, Esq., of Kensington, Middlesex, and manufactured by the exhibiters; a rick stand pillar, of wrought and cast iron, price 5*s.*; and several double and single Norfolk pig troughs, made of cast and wrought iron, prices from 7*s.* 6*d.* to 1*l.* 7*s.*, invented and manufactured by the exhibiters; iron pig troughs with circular bottoms, price 4*s.* and 6*s.*; and a Windsor pig trough, price 2*l.* 5*s.*, improved and manufactured by the exhibiters; an iron hutch pig trough, made of cast and wrought iron, price 2*l.* 15*s.*; and a patent turnip and root rasping or pulping machine, for cattle or sheep (new implement), price 4*l.* 10*s.*, invented and manufactured by the exhibiters; a patent root grater or turnip cutter, price 4*l.* 10*s.*, invented by G. Bushe, Esq., of Lismore, and Dr. Barter, of Blarney, Ireland, improved and manufactured by the exhibiters; a patent self rolling mangle, price 7*l.* 7*s.*, invented by Charles Barnard, of Norwich, and manufactured by the exhibiters; a cottage mangle, price 3*l.* 10*s.*, invented and manufactured by the exhibiters; a wrought iron portable or folding bedstead, price 19*s.*, improved and manufactured by the exhibiters; three cast iron window frames and casements, price 14*s.* to 1*l.* 5*s*; a cast iron window frame with two casements, price 2*l.* 2*s.*; ornamental wrought iron hand gates and cast iron posts, price 4*l.* 10*s.* and 3*l.* 10*s.*; and wrought iron carriage gates with cast iron posts, price 6*l.* and 6*l.* 10*s.*, invented and manufactured by the exhibiters; a wrought iron fan braced field gate, price 2*l.*, improved and manufactured by the exhibiters; a six bar strong wrought iron field gate, price 1*l.* 7*s.*; and a seven bar strong wrought iron field gate, price 1*l.* 12*s.*, invented and manufactured by the exhibiters.

William Busby, of Newton-le-Willows, near Bedale, Yorkshire.

A light two-horse waggon, price £28, if with pole and shafts £1 5*s.* extra, or harvest raves £1 5*s.* extra, invented and improved by William Lister, Esq., of Dunsa Bank, and manufactured by the exhibiter; a one or two-horse cart, price £12 12*s.*, if with harvest raves £2 2*s.* extra (a prize of £10 was awarded to this cart at the Exeter meeting, in 1850; it was also included in the award of the council medals of the Great Exhibition of 1851, and had a £10 prize at Lewes, in 1852, also the silver medal at Lincoln, in 1854, and the Bath and West of England Society's prize for three years in succession); and a one-horse cart, price £13 13*s.*, if with harvest raves £2 2*s.* extra, invented by William Lister, Esq., of Dunsa Bank, improved and manufactured by the exhibiters (this cart is on the same principle as the preceding, but lighter, 3 in. wheels); a one-horse cart, price £12, if with harvest shelvings £2 extra; and a light one-horse cart, price £10, if with harvest shelvings £1 10*s.* extra, invented and manufactured by the exhibiter; a two-wheel deep plough, price £4 15*s.* (this plough received the prize at the society's meeting at Northampton in 1847, £10 at York in 1848, and £7 at Lewes in 1852); a two-wheel plough for general purposes, price £4 4*s.*, if with skim, clasp chain, and weight 7*s.* 6*d.* extra (this plough received the award of the council medal at the Great Exhibition, 1851, and at Gloucester, 1853); a two-wheel plough for general purposes, price £4 7*s.* 6*d.*; a two-wheel plough for general purposes, price £4 (light); a two-horse plough with two wheels, price £3 17*s.* 6*d.*; a light two-horse plough with two wheels, price £3 12*s.* 6*d.*; a swing plough, price £3 7*s.* 6*d.*; a ridge plough, price £4 4*s.*; a horse hoe with five tines, price £3 15*s.*; a horse hoe with five tines, price £3 10*s.*; a horse hoe with five tines and harrow, price £3 3*s.*; a horse hoe with three tines and harrow, price £2 10*s.* (the Royal Agricultural Society awarded prizes to this implement for five years in succession, also at Taunton in 1852, and at Plymouth in 1853); and a light horse hoe, without Norwegian harrow, price £2, invented, improved, and manufactured by the exhibiter; a clod crusher and Norwegian harrow, price £6 6*s.*, invented by the Rev. W. Wharton, of Barningham, improved and manufactured by the exhibiter (the special prize was awarded to this implement at the Plymouth meeting in 1853); and a horse rake, price £8, manufactured by the exhibiter.

William Lister, of Dunsa Bank, Richmond, Yorkshire.

A patent implement for loosening turnips in the ground and cutting off the tails (new implement), price £6; a patent light steel hoe with two blades, to cut off turnip tops (new implement), price 5*s.*, invented by the exhibiter, and manufactured by William Busby, of Newton-le-Willows, Bedale, Richmond; a patent implement for tailing turnips (new implement), price £6 10*s.*; and a patent light steel hoe with two blades, to cut off turnip tops, price 5*s.*, invented by the exhibiter, and manufactured by John Gath, of Gayles, Richmond, Yorkshire.

Caldow and M'Kinnel, of Palmerstone Iron Works, Dumfries.

Cart turnip cutting machines (new implements), price £9 9*s.* and £13 13*s.*; a turnip sowing machine, price £5 5*s.*; and a steam cooking apparatus for preparing food for cattle, price £15 10*s.*, invented improved, and manufactured by the exhibiters; a two-horse grubber, price £5 15*s.*, improved and manufactured by the exhibiters; and hand-power guillotine chaff engine, price £6, invented by James Ward, of Stratford-on-Avon, improved and manufactured by John Gillett, of Brailes, near Shipston-on-Stour.

James Harkness, of Heedless Cross, near Gretna Green, Dumfriesshire.

A single swing iron plough (new implement), price £4 8*s.*, invented and manufactured by the exhibiter; a double mould-board iron plough, price £3 5*s.*, improved and manufactured by the exhibiter; a double iron plough, price £3 10*s.* 6*d.*, manufactured by the exhibiter; a scarifier or cultivator, price £6; and a scarifier, grubber, or cultivator, price £3 12*s.* 6*d.*, improved and manufactured by the exhibiter.

E. and T. Humphries, of Pershore, Worcestershire.

A combined thrashing, shaking, riddling, winnowing, and barley horning machine, price £80 (this machine obtained the first prize at the Bath and West of England, at the Worcester, and at the Bridgnorth Agricultural Society's meetings last year, and was specially commended at the Royal Agricultural Society's meeting at Lincoln); and riddles for combined thrashing machine, price 6*d.* and upwards per foot, according to size of holes, invented, improved, and manufactured by the exhibiters.

Robert Hunt, of Earl's Colne, near Halstead, Essex.

An improved engine, for drawing clover and trefoil seed, prices: for horse power £27 5*s.*, steam £25 5*s.*, blower attached £4 11*s.* extra, iron wheels and draught £4 4*s.*, wood wheels and draught £5 5*s.*; an improved Essex scythe, price 11*s.* 6*d.*; a hand seed drill, for drilling turnips and mangold, price £1 5*s.*, ridge wheels 7*s.* 6*d.* extra; a hand seed drill, for drilling turnips, &c., price £1 15*s.*; and a hand seed drill, for two rows, price £2 10*s.*, all improved and manufactured by the exhibiter.

Samuel Nye, of 79, Wardour-street, Soho, London.

Three mincing machines for mincing meat, vegetables, fruit, &c., prices £2 2*s.*, £3 3*s.*, and £1 10*s.*, invented by S. Nye

and John Gilbert, of 79, Wardour-street, improved and manufactured by the exhibiter.

Richard Read, of 35, Regent Circus, Piccadilly, London.

A patent subsoil pulverizer, price £5 5s., invented by the late John Read, of 35, Regent-circus, improved and manufactured by the exhibiter (a prize of £10 was awarded for this implement at Southampton in 1844, at Shrewsbury in 1845, at Newcastle-on-Tyne in 1846, and at Northampton in 1847; a patent agricultural fire engine, price £18 18s. (a silver medal was awarded for this engine at Exeter in 1850); and a patent watering engine, price £7 10s., invented, improved, and manufactured by the exhibiter; a patent injecting instrument and tube, complete, for horses, cattle, &c., price £2 10s., invented by the late John Read, of 35, Regent-circus, improved and and manufactured by the exhibiter (this instrument was highly commended by the judges at the Lewes meeting in 1852, and at Gloucester in 1853); hollow probangs, for relieving hoven or choked cattle, &c., price £1 10s. and £1 1s.; a hollow probang, for relieving hoven or choked sheep, calves, &c., price 10s.; patent hand watering machines, price £2 12s. 6d., and £2 2s.; and a patent double action greenhouse pump, price £4 10s., (this pump was highly commended by the judges at Gloucester in 1853); and a patent greenhouse syringe, price £1 10s., invented, improved, and manufactured by the exhibiter.

Mapplebeck and Lowe, of Birmingham.

Four platform weighing machines of improved construction, price, with weights complete, 3*l.* 10s. to 6*l.* 5s., invented and manufactured by W. and T. Avery, of Birmingham; a three-cwt. weighing machine, price 2*l.* 5s., manufactured by W. and T. Avery, of Birmingham; a three-cwt. weighing machine, and set of weights, price, machine and weights complete, 2*l.* 12s. 6d., manufactured by W. and T. Avery and exhibiters, of Birmingham; a platform weighing machine, to weigh from 1lb. to 3 tons, price 25*l.*, invented and manufactured by W. and F. Avery, of Birmingham; a two-knife chaff engine, price 2*l.* 10s., improved and manufactured by the exhibiters; a two-knife chaff engine, price 4*l.* 15s. (awarded a prize at the Royal Agricultural Society's meeting at Lewes in 1852, at Gloucester in 1853, and at Lincoln in 1854, as the best machine for hand power); and a two-knife chaff engine, price 8*l.* 10s., invented and manufactured by J. Cornes, of Barbridge; a two-knife registered chaff engine, price 12*l.* 10s., invented and manufactured by J. Cornes, of Barbridge; an improved oat and bean crusher, for hand power, price 5*l.*; a portable kibbling mill on a stand, price 3*l.* 10s.; and two portable bean mills on stands, price 3*l.* 10s. and 5*l.* 10s., manufactured by the exhibiters; a patent turnip cutter, price 4*l.*, invented by the late James Gardner, of Banbury, manufactured by the exhibiters (a silver medal was awarded to the exhibiters for this turnip cutter at the Northampton meeting of the Royal Agricultural Society of England); an improved oilcake breaker, price 3*l.* 3s., improved and manufactured by the exhibiters; an oak churn, price 2*l.* 17s. 6d., improved and manufactured by Robinson and Son, of Coventry; a single cheese press, price 2*l.* 10s.; a patent mangle, price 10*l.* 10s.; and a linen press, price 2*l.* 10s., improved and manufactured by the exhibiters; a portable iron bedstead, price 10s. 6d.; a patent solid iron stump bedstead, price 1*l.* 1s. 6d.; an improved garden engine, price 5*l.*; and an iron garden roller, price 2*l.* 5s., manufactured by the exhibiters; a patent lawn mowing machine, price with packing case 6*l.*, invented by E. Budding, improved and manufactured by Ferrabee and Sons, of Thrupp Mills; a bronzed ornamental cast-iron garden seat, price 2*l.* 10s., manufactured by the Coalbrookdale Company; a new Digby-pattern bronzed cast-iron garden seat, price 1*l.* 10s.; and a pair of garden chairs, price 1*l.* 5s. each, manufactured by the exhibiters; a wrought-iron folding garden stool, with elastic galvanized wire seat, price 4s. 6d., invented and manufactured by Barnard and Bishop, of Norwich; specimens of game-proof wire netting (painted), price 4d. to 8d. per yard; specimens of galvanized wire netting, price 1s. 1½d. to 1s. 6d. per yard; an improved portable forge, price 4*l.* 4s.; a pair of cart arms and boxes, price 1*l.* 3s. 6d; a mail patent axle with short bolts, price 1*l.* 7s. 6d.; and a mail patent axle with long bolts, price 3*l.* 3s., manufactured by the exhibiters; a set of cast-iron stable furniture, price complete 4*l.*, invented and manufactured by the exhibiters; a chest of emigrant's tools, price 8*l.*, manufactured by the exhibiters and others; an improved hand road-scraping machine, price 3*l.* 3s., manufactured by Browne and Harris, of Ilchester; a crane and winch, price 7*l.*; an improved corn dressing or winnowing machine, price 7*l.*; an iron sack cart, price 10s. 6d.; and a sack cart with wood frame, price 15s., manufactured by the exhibiters; a set of patent draining tools, price 1*l.* 12s. 3d., invented by Josiah Parkes, Esq., of London, and manufactured by W. A. Lyndon, of Birmingham (the prize of 5*l.* was awarded to the exhibiters for these tools at the Northampton meeting of the Royal Agricultural Society, also the prize at Lewes in 1852); two sets of patent draining tools, price 1*l.* 8s. 9d. and 1*l.* 4s. 9d.; a bundle of patent spades, price 3s. 3d. to 3s. 9d. each; and a bundle of four-prong solid steel digging forks, price 6s. each, manufactured by W. A. Lyndon, of Birmingham; a bundle of five-prong solid-steel digging forks, price, light 4s. 8d., strong 5s. each, manufactured by F. Parkes, of Stonehouse Forge; a bundle of five-prong solid-steel digging forks, price, strong 5s. 6d., extra strong 6s. each, invented and manufactured by F. Parkes, of Stonehouse Forge; a bundle of three-prong solid-steel dung forks, price 3s. to 3s. 6d. each; a bundle of four-prong solid-steel dung forks, price 4s. to 4s. 4d. each; a bundle of solid-steel couch-grass forks, price 3s. 9d. to 4s. 3d. each; and a bundle of solid-steel boys' digging and border forks, price 3s. 6d. to 5s. each, manufactured by F. Parkes, of Stonehouse Forge; a chain harrow, price 4*l.*, manufactured by the exhibiters; a patent light broad-share plough, price 4*l.* 14s. 6d.; and a patent light broad-share plough, with iron beam, price 5*l.* 5s., invented and manufactured by E. H. Bentall, of Heybridge; a set of three-beam iron harrows, price 4*l.* 4s.; and a set of patent jointed iron harrows, price 3*l.* 14s., extra for patent joints 7s. 6d., invented by J. Howard and W. Armstrong, of Bedford, improved and manufactured by J. and F. Howard, of Bedford; two sets of improved trussed whippletrees, price 9s. and 9s. 6d., invented by E. W. Harding, of Old Springs, and manufactured by the exhibiters; and a set of improved iron trussed whippletrees, price 10s. 6d., invented by E. W. Harding, of Old Springs, and manufactured by the exhibiters; a patent iron swing plough, price 3*l.* 9s., with skim coulter 5s. extra; and a patent iron plough with two wheels, price 4*l.* 10s., with skim coulter 5s. extra, invented and manufactured by J. and F. Howard, of Bedford; a set of sickles and reaping hooks, price 9d. to 1s. 6d. each, manufactured by Sorby and others; a Milner's "Holdfast" and double fire-resisting safe, price 12*l.*, invented, improved, and manufactured by T. Milner and Son, of Liverpool; a patent fire-resisting chambered strong sheet iron box, price 4*l.*, improved and manufactured by S. Whitfield, of Birmingham; a bundle of galvanized iron buckets, price 2s. 6d. to 3s. 6d.; and an ornamental scroll weather vane, price 2*l.* 15s., manufactured by the exhibiters; and a stand of models.

John Patterson, of Beverley, Yorkshire.

Two Patterson's patent reaping machines, prices 38*l.* and 30*l.* (new implements), invented and manufactured by the exhibiter.

Thomas Robinson, of Linstock, near Carlisle, Cumberland.

A plough, best adapted for general purposes, made of iron, price 4*l.*, improved and manufactured by the exhibiter.

William Smith, of Kettering, Northamptonshire.

An improved double-blasted winnowing and blowing machine (new implement), price 10*l.* 10s.; an improved steerage horse hoe, with double bars, price with lever complete 7*l.* 10s.; an improved steerage horse hoe, with double bars, price 7*l.* 10s.; and an improved steerage horse hoe, with single bar, price 5*l.* 10s., all invented, improved, and manufactured by the exhibiter.

Tuxford and Sons, of Boston and Skirbeck Iron Works, near Boston, Lincolnshire.

An eight-horse power patent portable housed steam engine, price 250*l.*; a six-horse power patent portable housed steam engine, price 210*l.*; a four-horse power patent portable housed steam engine, price 190*l.*; a six-horse power fixed steam engine, price 175*l.*; a four-horse power fixed steam engine, price 110*l.*; a patent combined thrashing, shaking, and win-

nowing machine, with elevators, and barley aveller of improved construction attached, price 95*l.*; a circular-saw table, with parallel fence plate and binding rollers, rails and horses, drag motion, and driving pulley, price 42*l.*, ditto without rails and horses, binding rollers, and drag motion, 20*l*, ditto with self-acting motions 75*l.*; and a circular-saw table, price 14*l.*, all invented by Weston Tuxford, of Boston, and manufactured by the exhibiters.

William Ball, of Rothwell, near Kettering, Northamptonshire.

An iron plough, price 4*l.* 8s. (a prize of 5*l.* was awarded to this plough for general purposes at the Royal Agricultural Society's meeting at Norwich, 1849; prize of 7*l.* at Exeter, 1850; a prize medal at the Great Exhibition of All Nations, 1851; also a first-class prize at the Dublin Exhibition, 1853; and commended at Lincoln, 1854); an iron plough, price 5*l.* 8s. (a prize of 7*l.* was awarded to this plough at the Royal Agricultural Society's meeting at Gloucester); and an iron plough, price 4*l.* 8s., all invented, improved, and manufactured by the exhibiter; a patent press corn drill on the flat, price 32*l.*; a cultivator, grubber, and scarifier, price 6*l.*; and a set of whippletrees for a plough, price 10s. 6d., invented and manufactured by the exhibiter.

J. Caborn, of Denton, near Grantham, Lincolnshire.

A double blast corn dressing machine, price 14*l.*, improved and manufactured by the exhibiter.

Bernhard Samuelson, of Banbury, Oxfordshire.

A Samuelson's patent Gardner's turnip cutter (double action), price on wheels 6*l.* 12s. 6d. (this implement obtained the prize medal at the Great Exhibition of 1851, and the 5*l.* prize at the Royal Agricultural Society's show at Lewes in 1852); a Samuelson's patent Gardner's turnip cutter (double action), price 5*l.* 10s. (this implement obtained the 5*l.* prize at the Royal Agricultural Society's show at Gloucester, 1853, and Lincoln, 1854); a Samuelson's patent Gardner's turnip cutter for sheep, price with wheels and handles 5*l.* 12s. 6d., without wheels 5*l.* 2s. 6d.; a Samuelson's patent Gardner's turnip cutter for sheep, price mounted on wheels 5*l.*; a Samuelson's patent Gardner's turnip cutter for sheep, price 4*l.* 10s.; a Samuelson's patent Gardner's turnip cutter for cattle, price 5*l.* 2s. 6d.; and a Samuelson's patent Gardner's turnip cutter, price 4*l.* 10s., if mounted on wheels 5*l.*, invented by the late James Gardner, of Banbury, improved and manufactured by the exhibiter; a Gauntlett's patent turnip and root pulper (new implement), price 4*l.* 10s.; and a Gauntlett's patent turnip and root pulper (new implement), price 4*l.* 10s, if fitted with rollers to grind roots to complete pulp 30s. extra., invented by W. H. Gauntlett, of Banbury, manufactured by the exhibiter; two patent turnip cutters, price 4*l.* 8s. each, invented by Edmund Moody, late of Maiden Bradley, improved by Hugh Carson, of Warminster, manufactured by the exhibiter; four small and useful chaff cutters, price 3*l.* each, invented and manufactured by the exhibiter; two rising mouth chaff cutters, for hand power, price 3*l.* 16s. each, manufactured by the exhibiter; a universal crushing or bruising mill, price 5*l.* 4s. 6d., invented by the late Mr. Stratton, of Bristol, improved and manufactured by the exhibiter; a bean splitting mill, price 2*l.*, invented, improved, and manufactured by the exhibiter; a linseed cake breaking machine for beasts and sheep, price 3*l.* 15s., improved and manufactured by the exhibiter; an Anthony's patent American churn, price 2*l.* 3s. (took a silver medal at the Society's meeting at Exeter, a prize medal at the Great Exhibition of 1851, and the 3*l.* prize at Gloucester, 1853), invented by Charles Anthony, of Pittsburg, United States, improved by W. Burgess, of London, and manufactured by the exhibiter; a registered atmospheric churn, price 1*l.* 11s. 6d., invented and manufactured by the exhibiter; six Budding's lawn mowing machines or grass cutters, with Samuelson's registered improvements, prices from 5*l.* 10s. to 6*l.* 15s., invented by E. Budding, of Dursley, improved and manufactured by the exhibiter; two garden rollers, prices 2*l.* 12s. 6d. and 3*l.* 18s., designed and manufactured by the exhibiter; a Kase's patent force and suction pump (double action), price without stand 13*l.*, on stand, and with socket handles to un-ship when not in use, 14*l.* 5s., invented by Kase, of the United States, improved and manufactured by the exhibiter; a galvanized sheet iron barrel pump, price 3*l.*, improved and manufactured by the exhibiter; a cast-iron pig trough, with semicircular bottom, price 2s. 6d. per running foot, manufactured by the exhibiter; three bundles of Parkes' celebrated cast steel forks, price 3s. each and upwards, invented and manufactured by F. Parkes, of Sutton Coldfield; a case of patent wrought-iron folding camp stools, price from 10s. 6d. each, invented by Brown Brothers, of London, and manufactured by the exhibiter; and a letter copying press, price 2*l.* 15s., improved and manufactured by the exhibiter.

John Whitehead, of Preston, Lancashire.

A No. 0 tile machine, price, with receiving table and cutting-off apparatus, 14*l.* 10s.; a No. 1 tile machine, price with receiving table and cutting apparatus 21*l.* (prizes were awarded to this machine at the Royal Agricultural Society's meeting at York, 1848, 20*l.*; at Norwich, 1849, 20*l.*; at Exeter, 1850, judges' commendation; at the Universal Exhibition, 1851, the prize medal; was not exhibited in 1852; at the Royal Agricultural Society's meeting at Gloucester, 1853, 10*l.*; at Lincoln, 1854, prize medal; besides a number of prizes at local meetings); a No. 2 double-box tile machine, price, including one receiving table and cutting-off apparatus, 28*l.*; an apparatus for working any of the afore-mentioned tile machines by steam or other power, price 5*l.* 5s.; a patent socketing apparatus, price, with one mould, 7*l.* 7s.; an improved brick pressing machine, price 16*l.* 16s.; and an improved iron pug mill, price 14*l.*, invented, improved, and manufactured by the exhibiter; a four-horse thrashing machine, price 44*l.*; an economic chaff engine, price 2*l.* 10s.; and a chaff engine, price 4*l.* 10s., improved and manufactured by the exhibiter; a patent cycloidal combined clod-crusher, press-wheel roller, land presser, and field roller, price 13*l.*, invented by William Jacobus Carl Hitchcock, agricultural engineer, of Lincoln, and manufactured by the exhibiter; a set of draining tools, price 1*l.* 12s.; a farm fire engine or garden engine, price 22*l.*, invented, improved, and manufactured by the exhibiter; a garden roller, price 2*l.*, and a land roller, price 12*l.* 10s., manufactured by the exhibiter; a mowing machine for lawns, &c., price 5*l.* 15s.; a set of hay racks, price, consisting of one each, 5s., 5s. 6d., and 8s. 6d., and a set of mangers, price 8s., 9s., and 13s., manufactured by the exhibiter; a malt mill, price 5*l.* 5s.; a mangling and wringing machine and washing machine combined, price 6*l.* 10s.; a combined wringing and mangling machine, price 3*l.* 15s.; a wrought iron plough, price 4*l.* 4s.; a corn crusher, price 5*l.* 10s.; and a turnip cutter, price 2*l.* 10s., improved and manufactured by the exhibiter; a set of pig troughs, price 11s., 14s., and 18s.; a roll of iron game proof wire netting, prices 4d. to 1s. 1d. per lineal yard; a roll of galvanized game proof wire netting, prices 5½d. to 1s. 6d. per lineal yard; and a set of improved curtain stable fittings, price of set 1*l.* 18s., manufactured by the exhibiter; a cheese press, price 1*l.* 18s.; a set of stack pillars, price 6s., 8s., and 10s.; a manure pump and stand, price 3*l.*; a set of patterns of iron hurdles; a steaming apparatus for food for cattle, price 5*l.* 18s.; and an oilcake breaker, price 2*l.* 10s., manufactured by the exhibiter.

Frederick John Wilson, of 32, Cadogan-place, Chelsea, Middlesex.

Five patent cottage allotment wheelbarrows, prices 1*l.* 5s. to 2*l.* 3s.; the scimitarian hedge slasher (new implement), price 4s.; the cottage allotment subsoil fork (new implement), price 6s. 6d.; the fly weight scythe (new implement), price 4s.; a Wilson's two-handled spade (new implement), price 6s., invented by the exhibiter, and manufactured by Mr. Medworth, of Baker-street Bazaar; and the patent cottage allotment wheelbarrow, price 2*l.* 10s., invented by the exhibiter.

James Blair, of Solway House, Carlisle, Cumberland.

A potato riddle (new implement), price 3*l.* 10s., invented by the exhibiter, and manufactured by Matthew Jefferson, of Carlisle.

Burgess & Key, of 103, Newgate-street, London.

A reaping machine (new implement), price 35 guineas (it received the Council medal at the Great Exhibition in 1851; the prize medal at the Yorkshire show in 1852, the award of

the Driffield Farmers' Club; first prize of the Durham County Meeting at Sunderland; and the award of the jury appointed at the nine days' trials of reapers at the Royal Agricultural College at Cirencester), invented by Cyrus Hall McCormick, of Chicago, United States of America, improved and manufactured by the exhibitors; a winnowing machine, price 10*l.*, invented by J. Grant, of New York, improved and manufactured by the exhibitors; seven force and lift pumps, or farm fire engines, price 8*l.* 8s. to 40*l.*, invented by Kase, of America, improved and manufactured by the exhibitors; a copper lift pump, price 4*l.* 10s.; and a galvanised iron lift pump, price 3*l.* 3s., improved and manufactured by the exhibitors; six patent American churns, price 1*l.* 15s. to 2*l.* 10s. 6d. (one of these churns received prizes at all the meetings of the Royal Agricultural Society, since its introduction, and also at the Great Exhibition, 1851), invented by C. J. Anthony, of America, improved and manufactured by the exhibitors; a barrel churn, price 6*l.* 6s., improved by the exhibitors; three bundles of Burgess and Key's patent corrugated and flexible gutta percha tubing, price, 2½ in. diameter 5s., 2 in. 4s. 6d., 1½ in. 3s. 6d. per foot, invented by Wm. Burgess, of London, and manufactured by the Gutta Percha Company, of London; a suction of corrugated gutta percha tubing, for a 6 in. Kase's pump, fitted with brass union, price, 2½ in. diameter, 10 ft. long, 3*l.* 3s.; ditto, for a 5 in Kase's pump, price, 2 in. diameter, 10 ft. long, 2*l.* 12s. 6d.; ditto, for a 4 in. Kase's pump, with brass union, price, 1¾ in. diameter, 10 ft. long, 2*l.* 7s. 6d.; a suction, part plain gutta percha tube, and part corrugated, for galvanised iron pump, with gutta percha joint, price 1*l.* 5s.; a roll of gutta percha tubing, price, ½ in. diameter, 3s. 8d. per lb., manufactured by the Gutta Percha Company, London; three rolls of gutta percha tubing, for garden or liquid manure purposes, price 3s. per lb.; four rolls of canvas hose, woven without seam, suitable for irrigation, price 4½d. to 9d. per ft.; samples of gutta percha driving bands—flat 2s. 4d., round 3s. 2d. per lb.; sample of india rubber driving bands, price 10d. per foot and upwards; a bundle of 5-tined digging forks, price 6s. 6d. each fork (these forks have received prizes at various meetings of the Royal Agricultural Society, and also at numerous shows throughout England), invented and manufactured by Francis Parkes, of Birmingham; several bundles of digging forks, price 4s. 6d. to 6s. 6d. each fork; two bundles of hay forks, price 1s. 9d. each and upwards; a bundle of pitching forks, price 4s. 9d. each and upwards; a bundle of steel spades, price 4s. 6d. each spade and upwards; a bundle of surface spades, price 4s. 6d. each; and bundles of tools (various), price 3s. 6d. each and upwards, all invented and manufactured by Francis Parkes, of Birmingham; two complete sets of draining tools, price 1*l.* 15s. and 1*l.* 10s. each, invented and manufactured by Francis Parkes, of Birmingham; a bundle of soil testers, price 7s. 6d. each, manufactured by Francis Parkes, of Birmingham; an improved farm or stable lantern, price 14s., manufactured by Price and Co., of Vauxhall; a wrought iron folding garden chair, price 12s. 6d., invented, improved, and manufactured by Barnard and Bishop, of Norwich; a wrought iron folding garden chair, price 15s. 6d.; a wrought iron garden seat, price 4s. 6d., invented and manufactured by Barnard and Bishop; and a parcel of jets for liquid pump, price 1*l.* 10s. and upwards.

Richard Coleman, of Chelmsford, Essex.

A patent improved land roller or clod crusher (new implement), price 22*l.* 10s., invented and manufactured by the exhibiter; a patent subsoil harrow or pulverizer, price 5*l.* 5s.; a patent expanding harrow, price 4*l.* (the prize medal was awarded to this implement at the Great Exhibition in 1851); and a patent expanding harrow, price 4*l.* 15s., invented, improved, and manufactured by the exhibiter; a patent wrought iron drag harrow, cultivator, or scarifier, price 8*l.*; three patent drag harrows, cultivators, or scarifiers, price 9*l.* and upwards; a patent drag harrow, cultivator, or scarifier, price 15*l.* (the Great Exhibition prize was awarded to this implement, 1851); and a patent cultivator (new implement), price 20*l.*, invented and manufactured by the exhibiter.

James Cornes, of Barbridge, near Nantwich, Cheshire.

A registered chaff cutting machine (No. 5), with three knives, cash price, delivered at Barbridge, 13*l.*, if fitted up to cut furze 10s. extra, and each length of cut charged 5s. extra (this machine gained a prize of 10*l.* at the Royal Agricultural Society's meeting at Shrewsbury in 1845; at Newcastle-upon-Tyne in 1846; at Northampton in 1847; the Society's silver medal at York in 1848; a prize of 10*l.* at Norwich in 1849; 10*l.* at Exeter in 1850; the prize medal of the Great Exhibition in 1851; a prize of 10*l.* at Gloucester in 1853; and a prize of 5*l.* at Lincoln in 1854); a registered chaff cutting machine (No. 6), with two knives, price 12*l.* 10s.; a chaff cutting machine (No. 1), with three knives, price 10*l.*; a chaff cutting machine (No. 3), with two knives, price 8*l.* 10s.; a chaff cutting machine (No. 4), with two knives, price 6*l.* 15s.; a chaff cutting machine (No. 9), with two knives, price 4*l.* 10s. (this machine gained a prize of 5*l.* at the Royal Agricultural Society's meeting at Lewes in 1852; a prize of 5*l.* at Gloucester in 1853; and a prize of 3*l.* at Lincoln in 1854); and a chaff cutting machine (No. 10), with two knives, price 4*l.* 10s., all invented by John Cornes, senior, of Barbridge, improved and manufactured by the exhibiter; and a chaff cutting machine (No. 11), with two knives, price 2*l.* 15s., invented, improved, and manufactured by the exhibiter.

John Dalton, of Langwathby, near Penrith, Cumberland.

A wooden plough (new implement), price 3*l.*, invented, improved, and manufactured by the exhibiter.

R. Forshaw & Co., of Liverpool.

A cart and cattle weighing machine, to weigh from 1lb. to 3 tons, price with pen for cattle 24*l.*, without 22*l.* (this machine took the first prize at the Highland and Agricultural Society's Show, 1854), invented, improved, and manufactured by the exhibiters; a 20-cwt. Fairbanks' patent condensing lever weighing machine, price on wheels 11*l.* 15s., without ditto 10*l.* 10s., invented by Fairbanks, improved and manufactured by the exhibiters; a sack weighing machine, to weigh from ¼lb. to 5 cwt., price 5*l.* 5s.; a sack weighing machine, to weigh from ¼lb. to 4 cwt., price 4*l.* 4s.; and a single lever weighing machine, to weigh from ¼lb. to 3 cwt., price 3*l.* 14s., invented, improved, and manufactured by the exhibiters; a large grain bruiser, price 14*l.* 14s. (received the first prize of the Highland and Agricultural Society in 1854), invented and manufactured by the exhibiters; a No. 2 bean and oat crusher, price with pulley 6*l.* 17s. 6d., without ditto 6*l.* 10s. (obtained the first prize of the Highland and Agricultural Society of Scotland as a hand-power crusher, in 1854); and a No. 1 crusher, price 5*l.* 5s., invented by Cartmell, improved and manufactured by the exhibiters; a Kealy and Co.'s patent turnip and root slicer, cutter, and pulper, price 5*l.* 15s. (many prizes and medals have been awarded to it), invented by Kealy and Co., of London, and manufactured by the exhibiters; a combined wheat mill and dressing machine (hand power), price 7*l.* 10s., invented, improved, and manufactured by the exhibiters; a sack holder, truck, and elevator, price 4*l.* 17s. 6d., manufactured by the exhibiters; and a wrought iron sack truck (No. 2), price 15s. 6d, invented and manufactured by the exhibiters.

Henry Goddard, of Nottingham.

A patent prize economical cooking apparatus, for a cottage or small farm kitchen, price 6*l.*; a patent prize (1851, Great Exhibition) economical cooking apparatus, price 15*l.*; also, attached to the range, Goddard's patent, smoke, heat, and steam disperser, which instantly enables the range to work as a common ordinary open fire range, price 1*l.* 10s. extra; a patent prize economical cooking apparatus, price 9*l.*; and a patent prize (1851, Great Exhibition) large open fire range or cooking apparatus, price complete 22*l.*, all invented, improved, and manufactured by the exhibiter.

Messrs. Hayes & Son, of Stamford, Lincolnshire.

An improved harvest cart (new implement), price 15*l.* 15s., without the adjusting apparatus to harvest cart 13*l.*, No. 2 body and carts to ditto 7*l.*; a one or two horse Scotch cart (new implement), price 14*l.* (shelving raves can be attached to this cart, if required, price 1*l.* 10s.); and a light spring lorrie or dray, price 30*l.*, invented, improved, and manufactured by the exhibiters.

E. and B. Johnson, of Flookersbrook Foundry, Chester.

A circular-saw bench, price 15*l.*; and a two-horse works for driving agricultural or other machinery, price 15*l.* 15s., invented,

improved, and manufactured by the exhibiters; and a four horse power fixed steam engine, price 110*l.*, invented by Messrs. Bury, Curtis, and Kennedy, of Liverpool, improved and manufactured by the exhibiters.

THOMAS JOHNSON, of Leicester; and WARREN SHARMAN, of Melton Mowbray, Leicestershire.

A linseed cake breaking machine, for beast and sheep, price 3*l.* 14s.; an improved registered rape and linseed cake breaking machine, for beast and sheep, price 3*l.* 17s. 6d.; an improved moulding and ridging plough, price 4*l.* 8s.; a wrought iron trussed beam turf and stubble paring plough, price 5*l.* 10s.; a strong wrought iron wheelbarrow, price 1*l.* 7s. 6d.; a two-knife chaff cutting machine, price 8*l.* 15s.; and a small two-knife chaff cutting machine, price 3*l.*, invented, improved, and manufactured by Thos. Johnson, of Leicester; an improved contracting weighing machine, price 3*l.* 15s., invented and manufactured by W. and T. Avery, of Birmingham; a three-cwt. sack weighing machine, price 2*l.*, invented, improved, and manufactured by Thos. Johnson, of Leicester; a twenty-stone set of improved iron weights, price 1*l.* 10s., improved and manufactured by Thos. Johnson, of Leicester; an ornamental cast iron rustic garden chair, price 1*l.* 14s., manufactured by Thos. Johnson, of Leicester; a handsome cast iron Elizabethan garden chair, with wood bottom, 5 ft. long price 2*l.* 12s. 6d., 3 ft. long 2*l.* 5s., 4 ft. long price 2*l.* 10s., 6 ft. long price 2*l.* 16s.; an elaborate cast iron Elizabethan garden chair, with wood bottom, 5 ft. 10 in. long price 3*l.* 3s., 4 ft. long price 2*l.* 15s.; and a handsome cast iron hat, coat, and umbrella stand, price 3*l.* 10s., designed and manufactured by the Coalbrookdale Company, of Coalbrookdale; a large cast iron fluted garden vase, price 1*l.* 13s. 6d.; and a handsome ornamental cast iron garden vase, with ornamental handles, price 2*l.* 5s., manufactured by Thos. Johnson, of Leicester; a large one knife improved safety chaff and litter cutter (new implement), price 9*l.* 10s., if fitted with pulley and shaft for horse or steam power 1*l.* extra, invented and manufactured by John Law, of Leicester; a one horse gear work, price 8*l.* 10s., if fitted with an extra shaft, coupling, and pulley, 15s. extra, manufactured by John Law, of Leicester; a bundle of improved registered tubular iron hand hay or corn drag rakes (24 teeth), price 16s. 6d.; a bundle of improved registered tubular iron twitch garden or stubble rakes, price, with a 6 ft. turned shaft 3s. 6d., if without shafts 3s. each; and a bundle of improved registered tubular iron hand hay rakes, with a 6 ft. turned shaft (new implement), price 3s. 6d. each, if without shafts 3s. each, invented, improved, and manufactured by Warren Sharman, of Melton Mowbray; a bundle of wood drag rakes, with 24 teeth, price best 24 teeth 10s. 6d.; and a bundle of sheet iron root or chaff scuttles, price 2s. 6d. each, improved and manufactured by Warren Sharman, of Melton Mowbray; a bundle of sheet iron root or chaff scuttles, price 3s. 3d. each, invented, improved, and manufactured by Warren Sharman, of Melton Mowbray; several bundles of sheet iron and galvanized iron root or chaff and corn scuttles, price 2s. 3d. to 5s. 3d. each, invented and manufactured by Warren Sharman, of Melton Mowbray; a bundle of iron buckets, price 1s. 8d. each; and a bundle of galvanized iron buckets, price 2s. 3d., invented, improved, and manufactured by Warren Sharman, of Melton Mowbray; a bundle of iron baskets, for farm and household purposes (new articles), price 2s. 6d. each, invented and manufactured by Warren Sharman, of Melton Mowbray; a bundle of galvanized iron baskets, for farm and household purposes (new articles), price 3s. each; and a poultry fountain, with two outlets, price 7s., a size larger with three outlets 10s. 6d., two sizes larger with four outlets 15s. each, invented, improved, and manufactured by Warren Sharman, of Melton Mowbray; an iron sack truck, with wood handles, price 12s.; a wood sack truck, with iron wheels, price 12s. 6d.; and a close range, for 3 feet 3 inches opening, price 5*l.* 10s., invented and manufactured by Warren Sharman, of Melton Mowbray; and a Melton Mowbray hunting saddle, price 3*l.* 15s., invented and manufactured by Richard Allen, of Melton Mowbray.

JOSEPH LONG, of Meriton's Wharf, London, Middlesex.

Twenty-seven casks and fifty jars, containing 780 gallons of non-poisonous sheep-dressing composition, termed "Long's Specific," price 6s. per gallon; twenty-two casks and fifty jars, containing 780 gallons of non-poisonous sheep-dressing composition, termed "Long's Preservative," or "Lamb Dressing," price 2s. 8d. per gallon; twenty-five jars, containing 195 gallons of non-poisonous cattle-dressing, termed "Long's Concentrated Preservative," price 4s. per gallon; and five cases, containing 10 dozen bottles of Long's Foot Rot and General Lotion, price 2s. 6d. per pint bottle, 1s. 3d. per half pint bottle, discovered and manufactured by the exhibiter; six dressing bowls of most convenient size, price 2s. 6d. each; five dressing forks, of size most convenient for use, price 1*l.* 10s. each; skins with wool of five Cotswold hoggets; the skin with wool of a Down and Cotswold cross-bred; the skin with wool of a Cotswold ewe hoggett; and the skin with wool of a South Down ewe, taken from the experimental flock of the exhibiter, and exhibited to show the improvement in the growth and quality of the wool produced by the use of Long's non-poisonous sheep-dressing; the fleece of a Cotswold ram, and three Cotswold ewe hoggett fleeces, taken from the experimental flock of the exhibiter.

JOSEPH LUCOCK, of Aspatria, near Carlisle, Cumberland.

A drain tile and pipe machine (new implement), price 45*l.*, invented and improved by the exhibiter, and manufactured by William Bell, of Carlisle.

JOHN PALMER, of Stockton-on-Tees, Durham.

Two patent compound-action clod crusher and roller (new implement, invented by John Patterson of Beverley, improved by John Patterson of Beverley and Brown Brothers of Stockton-on-Tees, and manufactured by Brown Brothers of Stockton-on-Tees for the exhibiter, price 30-inch discs with travelling wheels 18*l.*, without travelling wheels 1*l.* 10s. less, with whippletrees and fittings instead of hooks on the frame 1*l.* 6s. extra, other sizes at prices in proportion, 5 per cent. off for cash; a combined reaping and mowing machine (new implement), price with back platform 25*l.*, with radiating platform 5*l.* extra, invented by Forbush and Co. of Buffalo, United States, improved by the exhibiter, and manufactured by Forbush and Co. and the exhibiter.

WILLIAM PEARSON and Co., of Leeds, Yorkshire.

A washing machine, price 9*l.*, invented and manufactured by the exhibiters; a washing machine, price 6*l.*, and a wringing machine, price 3*l.* 3s., improved and manufactured by the exhibiters; a washing machine, price 8*l.*, and a wringing machine, price 1*l.* 15s., invented and manufactured by the exhibiters.

SMITH, BROTHERS, and Co., of 112, Stirling-road, Glasgow, Lanarkshire.

A fixed horizontal steam engine, 8-horse power (new implement), price 133*l.*; a corn and bean bruising machine (new implement), price 8*l.*; a circular-saw table, price 13*l.* 10s.; a cart and cattle weighing machine, price 14*l.*; and a portable sack weighing machine, price 3*l.* 15s., invented, improved, and manufactured by the exhibiters.

JAMES USHER, of Edinburgh.

A locomotive steam cultivator (new implement), price 580*l.*, invented by the exhibiter, and manufactured by William and and George Bertram of Edinburgh.

JOHN ALLIN WILLIAMS, of Baydon, near Hungerford, Wiltshire.

A cultivator, grubber, and scarifier (new implement), price complete, as three implements, with four beams 18*l.*, ditto with three beams 15*l.*, invented and manufactured by the exhibiter.

BARTON and SON, of the Crescent Coach Factory, near Carlisle, Cumberland.

A Prince George phaeton, price 45*l.*, and a dog car, price 26*l.*, invented and manufactured by the exhibiters.

JAMES BOYDELL, of Camden Works, Camden Town, London, Middlesex.

A portable steam engine, fitted with an endless railway, price including patent right 500*l.*, invented and improved by

the exhibiter, the engine manufactured by R. Bach and Co., Birmingham, and the endless railway by Boydell and Glasier of Camden Town; a waggon, fitted with the apparatus or endless railway, price 70*l.*, invented and improved by the exhibiter, manufactured by Boydell and Glasier of Camden Town; and a set of ploughs, price 10*l.* 10s. the set, invented by the exhibiter, manufactured by Boydell and Glasier of Camden Town.

JOHN CROFT, of Grayrigg, near Kendal, Westmoreland.

A two-horse cultivator and grubber (new implement), price 5*l.* 10s., or 5d. per lb. for lighter or heavier implements, invented by Joseph Airey Dawson of Selside, manufactured by the exhibiter.

JOHN GOUCHER, of Worksop, Nottinghamshire.

A five-horse power patent portable thrashing machine, price 60*l.*, invented and manufactured by the exhibiter; a seven-horse power patent combined portable thrashing machine, price 95*l.*; and a seven-horse power patent fixed thrashing machine, price 145*l.*, invented and manufactured by the exhibiter.

JOHN GRAY and Co., of Uddingston, near Glasgow, Lanark, N.B.

An eight-horse power high pressure overhead crank steam engine, price with cylindrical boiler as above, including erection (purchaser paying carriage, engineers' board and lodging, and railway fares) 155*l.*; the same engine and fittings, but with flue and furnace idside of boiler, complete 175*l.*; and an improved two-horse fixed thrashing machine, price including erection (the purchaser paying carriage, millwrights' board and lodging, and railway fares) 40*l.*, improved and manufactured by the exhibiters; an improved two-horse swing or Scotch plough, price 4*l.* 15s., invented, improved and manufactured by the exhibiters; a parallel lever subsoil pulveriser, price 7*l.*, without lever 6*l.*, ditto with two tines 5*l.* 5s., invented and manufactured by the exhibiters (awarded first prize of 5*l.* at the Lewes meeting, 1852); an improved field grubber, price 6*l.*, invented and improved by the exhibiters; an improved five-tined drill grubber, price 4*l.* 5s., invented and manufactured by the exhibiters; a light drill scuffle or hoe, price 3*l.*, invented by the exhibiters; an improved horse hoe for drill crops, price 4*l.*, invented and manufactured by the exhibiters; and an improved double drill turnip sowing machine, price 7*l.*, improved and manufactured by the exhibiters.

DAVID HARKES, of Mere, near Knutsford, Cheshire.

A patent reaping and mowing machine, price 25*l.*, and a compound lever cheese press, price 5*l.*, invented, improved and manufactured by the exhibiter (awarded the medal at the Manchester and Liverpool Agricultural Society's show at Warrington); a curd mill, price 2*l.*, and a machine for thinning and hoeing turnips, price 5*l.* 15s., invented and manufactured by the exhibiter.

HERNULEWICZ, MAINE, and Co., of Glasgow.

A strong wrought iron gate for field purposes, with cast iron pillars, price 1*l.* 18s. 3d., improved and manufactured by the exhibiters; a wrought iron tension gate for field purposes, with handsome cast iron fluted pillars, price 2*l.* 1s. 6d.; a strong wrought iron gate for field purposes, hung to fine cast iron pillars, price 2*l.* 8s. 6d.; a fine strong wrought iron double diagonal gate for field purposes, with handsome cast iron fluted pillars, price 2*l.* 18s. 6d.; a strong wrought iron gate for field purposes, price 1*l.* 18s. 6d.; a fine wrought iron modern Gothic gate, with two wickets and handsome castellated piers, price 18*l.* 10s. per set; and a set of iron and wire portable flakes, price 6s. per flake, invented and manufactured by the exhibiters; a set of strong wrought iron portable hurdles, price 5s. 5d. per hurdle, or 2s. 6d. per lineal yard, improved and manufactured by the exhibiters; an iron and wire hayrick, on the newest principle, price 1*l.* 5s., covered with sheet iron 1*l.* 15s., invented and manufactured by the exhibiters; a cast iron pheasant or poultry feeder, price 1*l.* 2s.; a set of long pig troughs, price from 6s. 6d. upwards; and a set of revolving pig troughs, price from 12s. upwards, improved and manufactured by the exhibiters; an iron corn rickstand, price 6*l.*, single pillars 4s. 6d. each, invented and manufactured by the exhibiters; a web of hare and rabbit proof galvanized wire netting, price 2ft. high 8¾d. per lineal yard; a web of medium hare and rabbit proof wire netting, price 2ft. high 8½d. per lineal yard; and a web of strongest wire netting, price 2ft. high 11d. per lineal yard, improved and manufactured by the exhibiters; a web of strong galvanized wire netting, price 5ft. high 2s. 8d. per lineal yard, invented and manufactured by the exhibiters; a set of hare and rabbit proof iron and wire flakes, price per lineal yard 2s. 2d. and upwards; and a set of fine garden chairs, price 1*l.* 15s. and upwards, improved and manufactured by the exhibiters; a set of iron and wire chairs, price 5s. 6d. and upwards, and a cast iron tomb railing, price 7*l.* 10s., invented and manufactured by the exhibiters; a set of elegant cast iron vases, price 5*l.* and upwards, and a set of cast iron flower stands, price 1*l.* 5s., improved and manufactured by the exhibiters; and a fine iron and wire archway, price 2*l.* 5s., invented and manufactured by the exhibiters.

JAMES and FREDERICK HOWARD, of Britannia Iron Works, Bedford.

A patent iron plough, with two wheels (marked P No. 2), price 4*l.* 5s., with skim coulter 5s. extra; a patent iron plough, with two wheels (marked PP No. 2), price 4*l.* 10s., with skim coulter 5s. extra (the following prizes have been awarded to Messrs. Howard's ploughs by the Royal Agricultural Society since 1841: The first prize of 5*l.* at the Liverpool meeting; the first prize of 5*l.* at the Bristol meeting; the first prize of 10*l.* at the Shrewsbury meeting; at Newcastle-upon-Tyne, the first prize of 10*l.* for the best plough for light land, and the first prize of 10*l.* for the best plough for heavy land, were both awarded to Messrs. Howard; also at Northampton, York, Norwich, Exeter, and Lincoln, in 1854, the first prize was—for the tenth time—awarded to Messrs. Howard for the best plough; J. and F. Howard also received the first prize for the best plough at the meeting of the Highland and Agricultural Society of Scotland, held at Berwick-upon-Tweed, in August, 1854); a patent iron plough, with two wheels (marked PPP), price 6*l.*, with skim coulter 6s. extra; a patent iron swing plough (marked P), price 3*l.* 15s., with skim coulter 5s. extra; a patent iron swing plough (marked PP), price 4*l.*, with skim coulters 5s. extra; a patent iron plough, with one wheel (marked P), price 3*l.* 15s., with skim coulter 5s. extra; a patent iron plough, with two wheels (marked P No. 1), price 4*l.* 5s., with skim coulter 5s. extra; a patent iron plough, with two wheels (marked PP No. 1), price 4*l.* 10s., with skim coulter 5s. extra; a patent double furrow plough, price 7*l.* 7s.; an improved ridge or double breast plough, price fitted as a swing plough 3*l.* 15s., ditto with one wheel 4*l.*, ditto with two wheels 4*l.* 5s.; a patent subsoil plough, or sub-pulverizer, price 5*l.* 15s. (the Royal Agricultural Society have awarded a first prize of 5*l.* to this implement); a set of new patent jointed iron harrows (marked No. 10), price 5*l.* 12s. 6d. (the following premiums for harrows have been awarded to Messrs. Howard by the Royal Agricultural Society: Derby meeting, 1844, first prize of 5*l.*; York meeting, 1848, first prize of 5*l.*; Exeter meeting, 1850, first prize of 5*l.*; Lewes meeting, 1852, first prize of 5*l.*; Gloucester meeting, 1853, first prize of 5*l.*; and two first prizes at the meeting of the Highland and Agricultural Society of Scotland, held at Berwick-on-Tweed, 1854); a set of new patent jointed iron harrows (marked No. 12), price 4*l.* 1s. 6d.; a set of new patent jointed iron harrows (marked No. 15), price 3*l.* 17s. 6d.; a set of patent three beam iron harrows (marked No. 10), price 4*l.* 4s.; a set of patent four beam iron harrows (marked No. 14), price 3*l.* 6s.; and a set of patent iron drag harrows (marked No. 17), price 6*l.* 10s.; all the above invented and manufactured by the exhibiters; a set of improved trussed whippletrees, price 11s. 6d., invented by Egerton Harding, Esq., improved and manufactured by the exhibiters; a set of improved equalizing whippletrees, price 1*l.* 6s., invented and manufactured by the exhibiters; an improved land presser or drill presser (new implement), price 16*l.*, invented by Mr. G. W. Baker, of Woburn Park Farm, and manufactured by the exhibiters; an improved horse hoe, price 3*l.* 5s. (the Royal Agricultural Society awarded the prize to this implement at Lewes and Gloucester); an improved horse hoe, price 2*l.* 15s.; a patent horse rake, price 8*l.* 10s. (this implement gained the two first prizes last offered by the Royal Agricultural Society for horse rakes); a patent horse rake, price 7*l.* 10s.; an improved field or land marker (new imple-

ment), price 5*l.* 10s.; and specimens of improved plough frames, plough wheels, casehardened ploughshares and breasts, invented and manufactured by the exhibiters.

JOSEPH LEE, of Stonnall, near Walsall, Staffordshire.

A portable engine, price 180*l.*, invented, improved, and manufactured by the exhibiter.

PORTER, HINDE, and PORTER, of Carlisle, Cumberland.

A brick machine, with pug mill combined (new implement), price £145, improved by John Francis Porter, C.E., of 32, Bessborough-street, and manufactured by the exhibiters.

WILLIAM FREEMAN ROE, of 70, Strand, London.

A hydraulic ram, price £15 15s., improved by Freeman Roe, late of 70, Strand, London, and manufactured by the exhibiter; a sluice valve, price £2 14s, invented by Freeman Roe, late of 70, Strand, London, and manufactured by the exhibiter; a revolving pump, on standards (new implement), price £20; and a revolving pump, on plank (new implement), price £8 8s., invented by Arthur Parsey, of Burton-crescent, London, and manufactured by the exhibiter; a farm fire pump, price £12; a garden engine, on barrow, price £4 4s.; a farm-yard pump, price £1 15s.; a lift pump, price £4; and a liquid-manure pump, on stand, price £2 10s., manufactured by the exhibiter; a hydrant or fire plug, with stand-pipe, price £4, invented by Freeman Roe, late of 70, Strand, London, and manufactured by the exhibiter; various descriptions of hose, of India rubber, gutta percha, canvas (wove and sewed), and leather for suctions and delivery, price 6d. per foot, and upwards; and a model ram, with tanks, &c., price £4 4s., manufactured by the exhibiter.

RANSOMES and SIMS, of Ipswich, Suffolk.

A Ransomes and Sims' patent iron plough, with two wheels, marked Y R C, price, fitted with two wheels, £4 10s.; fitted with one wheel, £4; fitted as a swing plough, £3 14s.; skim coulter, 5s. extra; steel instead of cast mouldboard, 12s. extra (Awarded the prize at the meeting of the Royal Agricultural Society at Lewes, 1852, and again at the Lincoln meeting, 1854, as the best plough for general purposes); a Ransomes and Sims' patent trussed beam iron plough, with two wheels, marked Y L, price with two wheels £4 10s., skim coulter 5s. extra, steel breast instead of cast 12s. extra (awarded the prize of £10 and silver medal as the best heavy land plough, and a prize of £10 and silver medal as the best light land plough, at the Royal Agricultural Society's meeting at Southampton; also a prize of £10 at the Royal Agricultural Society's meeting at Northampton, and the council medal of the Great Exhibition awarded to this plough as made by Busby); a Ransomes and Sims' patent trussed beam iron plough, with one wheel, marked Y S C, price fitted with two wheels £4, fitted as a swing plough £3 3s., with one wheel £3 9s. (this plough is much used in Ireland, and at the Royal Agricultural Improvement Society's meeting at Armagh, in 1854, obtained the first class medal as "the best plough"); a Ransomes and Sims' patent trussed beam iron plough, with two wheels, marked Y V R, price fitted with two wheels £4 10s., fitted with one wheel £4, fitted as a swing plough £3 14s., if fitted with steel instead of cast breast 10s. extra; a Ransomes and Sims' patent iron trussed beam spring plough, marked Y O H, price £3, and a Ransomes and Sims' patent solid beam iron plough, with two wheels, marked V R S (new implement), price, with two wheels, £5 15s., if with strong wrought instead of cast iron £6 10s., invented, improved, and manufactured by the exhibiters (this plough is similar in construction to the V R two horse plough, described as No. 4); a Ransomes and Sims' patent trussed beam iron plough, marked Y U L, price £6 6s., invented by John Clark, of Long Sutton, Lincolnshire, improved and manufactured by the exhibiters (obtained the silver medal at the meeting of the Royal Agricultural Society at Norwich, 1849); a Ransomes and Sims' patent trussed beam iron plough, marked Y D T, price, in iron, with one wheel, Y D T, £4 8s.; curved cutters, 10s. extra; a Ransomes and Sims' plough, with wood beam and handles, marked D T, price £3 3s.; a Ransomes and Sims' one-horse swing plough, marked O H, price £2 4s, and a Ransomes and Sims' patent iron double plough, marked Y V R D, price £7 7s, invented, improved, and manufactured by the exhibiters; a Beauclerk's trussed beam patent plough and subsoiler, with two wheels (new implement), price £8 15s., and a Beauclerk's patent Archimedian subsoil plough, with wheels (new implement), price £4 10s., invented by Lord Beauclerk, and manufactured by the exhibiters; a Cotgreave's patent subsoil and trench plough, price £10 10s., invented and improved by Robert Cotgreave, of Ipswich, and manufactured by the exhibiters; a set of Ransomes and Sims' patent trussed iron whippletrees, price £1 3s.; a Ransomes and Sims' improved Suffolk grubber, with hind-wheels and draught rod, price £5 10s.; and a Ransomes and Sims' two-horse scarifier, price, fitted with points £9 9s., cast hoes (per dozen), 6s., points (per dozen) 4s., steel hoes (each) 2s., invented, improved, and manufactured by the exhibiters; a Biddell's patent wrought iron scarifier, grubber, or cultivator (No. 2), price £24, invented by Arthur Biddell, of Playford, improved and manufactured by the exhibiters (received Royal Agricultural Society prize at Liverpool 1841, at Northampton 1847, at York 1848, at Norwich 1849, at Lewes 1852, and at Gloucester 1853; a Ransomes' improved Suffolk horse drag rake, price £7 10s. (highly commended at the Royal Agricultural Society's meeting, Lincoln, 1854); and a Ransomes' iron hand drag rake on wheels, price £1 15s., invented, improved, and manufactured by the exhibiters; a Ransomes and Sims' hand drag rake, price 12s.; a Biddell's patent bean cutter (No. 1), price £3 15s. (awarded the silver medal of the Royal Agricultural Society at Gloucester; also the silver medal of the Yorkshire Agricultural Society at York, 1853; and a second class medal at the meeting of the Royal Agricultural Improvement Society of Ireland at Killarney, 1853); a Biddell's patent bean cutter (No. 2), price £6 15s.; if fitted with fast and loose pulleys for steam, £7 16s.; and a Biddell's patent universal mill, price £10; invented by G. A. Biddell of Ipswich; improved and manufactured by the exhibiters; a Ransomes and Sims' patent steel oat mill, No. 4 (new implement), price £3 15s.; a Ransomes and Sims' bruising mill, No. 1, for horse or steam power, price £16 16s; a Ransomes and Sims' barley awner, price £6 6s.; a Ransomes and Sims' oil cake breaker, No. 1, price £2 5s.; a Ransomes and Sims' improved oil cake breaker, No. 8, price £5; a Ransomes and Sims' chaff cutter, No. 1, for horse or steam power, price, with two knives and rise-and fall rollers, £15 15s., with three knives and rise-and-fall rollers £16 16s., with three knives and fixed rollers, £15; a Ransomes and Sims' chaff cutter, No. 2, for hand or horse power, price, for hand or horse power £10, patent striking out gear £1 extra; a Ransomes and Sims' chaff engine, No. 3, for hand power, price £4 15s. (highly commended at the Royal Agricultural Society's meeting at Lincoln, 1854); a Ransomes and Sims' hand power chaff cutter, No. 16 (new implement), price 3*l.* 15s.; and a Ransomes and Sims' chaff cutter, No. 14, price 4*l.* 4s., invented, improved, and manufactured by the exhibiters; a patent mill (C), for grinding all kinds of grain, price 18*l.*, invented by George Harwood, of Ipswich, improved and manufactured by the exhibiters; a Ransomes and Sims' circular-saw bench, price, with boring bits, 30*l.*, invented, improved, and manufactured by the exhibiters; a set of Bruce's patent stable fittings, price, complete, 5*l.* 7s. 6d., invented and improved by James Bruce, of Gwyrch Castle, Ireland, and manufactured by the exhibiters; a Gardner's single-action turnip cutter, with wheels and handles, price 4*l.* 10s., wheels and handles 13s. extra; a Gardner's turnip cutter, double action, price 5*l.* 10s., invented by J. Gardner, of Banbury, improved and manufactured by the exhibiters; a Bushe and Barter's improved patent root grater, price 4*l.* 10s., invented by Bushe and Barter, of Lismore, improved and manufactured by the exhibiters; a Ransomes' horse-work for one horse, with intermediate motion, price 18*l.* 10s., invented, improved, and manufactured by the exhibiters; a Budding's grass cutting machine, 19 inches, price 5*l.* 17s. 6d., invented by Budding, of Dursley, improved and manufactured by the exhibiters; a Ransomes and Sims' circular hog trough, price 18s.; a Ransomes and Sims' circular pig trough, price 10s., and Ransomes' circular bottomed pig troughs, price 2s. to 8s. 9d., invented, improved, and manufactured by the exhibiters; a circular bottomed hog trough, price 5s., invented and manufactured by the exhibiters; Ransomes' circular bottomed hog troughs, price 10s. 6d. to 15s. 6d., invented, improved, and manufactured by the exhibiters; a Sillett's digging fork, price 7s. 6d.; and a Sillett's garden fork, price 6s. 6d., invented by Sillett, of

Kelsale, improved and manufactured by the exhibiters; a Ransomes' improved greasing jack, price 1*l.* 5*s*, and a Ransomes' corn dressing machine, No. 2, price 10*l.*, invented, improved, and manufactured by the exhibiters; a Smith and Ashby's patent hay making, price £15 15*s.*, invented by Smith and Ashby, of Stamford, improved and manufactured by the exhibiters; a Ransomes' improved horizontal direct-action eight-horse power fixed steam engine, price £195, invented and manufactured by the exhibiters (received at the Royal Agricultural Society's meeting at Lewes, 1852, the prize of 10*l.*; at Gloucester, 1853, was commended; at Lincoln, 1354, received first prize); a Ransomes' improved horizontal direct-action four-horse power fixed steam engine, price £150; a Ransomes' improved five-horse power portable steam engine, price £190; a Ransomes' improved seven-horse power portable steam engine, price £215, with heating apparatus £230 (at the Royal Agricultural Society's meeting at Lewes, 1852, commended; at Gloucester, 1853, commended; at Lincoln, 1854, received a prize of 10*l.*); a Ransomes' two-horse power portable thrashing machine, price 42*l.* (awarded the prize at the Royal Agricultural Society's meeting at Gloucester, 1853, as the best two-horse thrashing machine; at the Royal Agricultural Improvement Society's meeting at Killarney, 1853, and again at the Armagh meeting of the same society, 1854, the first prize was awarded to this machine); a Ransomes and Sims' patent four-horse power portable thrashing machine, with shakers and riddle (new implement), price 90*l.*; a Ransomes and Sims' patent portable steam thrashing machine, with shaker and riddle, price £60; a Ransomes and Sims' patent portable steam thrashing machine, with bolting barn-work, to shake, riddle, and prepare the corn for finishing dressing machine, price 85*l.*; a Ransomes and Sims' patent stationary thrashing machine, for steam or other power, price £55; and a Ransomes and Sims' patent stationary combined steam thrashing machine, price 150*l.*, invented, improved, and manufactured by the exhibiters; a Budding's 16 in. grass cutter, price 5*l.* 10*s.*, and a Budding's 22 in. grass cutter, price 6*l.*, invented by Budding, of Dursley, improved and manufactured by the exhibiters; a Ransomes' turnip slicer, price 1*l.* 15*s.*, and a set of three-beam harrows and whippletrees, price 3*l.* 10*s.*, invented and manufactured by the exhibiters, and a set of four-beam harrows and whippletree, price 3*l.* 6*s.*, invented by Armstrong, and manufactured by the exhibiters.

Isaac James, of Cheltenham, Gloucester.

A patent liquid manure distributor or water cart, price, 250 gallons, suitable for working by horse, cart 8½ cwt., tire 4 in., 22*l.*; and a patent liquid manure distributor or water cart, to hold 150 gallons, price 18*l.*, invented and manufactured by the exhibitor.

Joseph Page, of Radford, near Leamington, Warwick.

A reaping machine (new implement), price 40*l.*, invented by Charles Phillips, of Offchurch.

James Smyth and Sons, of Peasenhall, Suffolk, and Witham, Essex.

A model of patent Suffolk lever corn drill, price 15*l.*; a model of patent Suffolk lever general purpose drill, price 25*l.*; a patent two rowed turnip, mangold wurzel, seed, and manure drill, price 15*l.* 5*s.*; a three rowed turnip, mangold wurzel, sead, and manure daill, price 17*l.* 10*s.*; a patent general purpose drill, price 38*l.*, if with steerage 4*l.* extra; a patent small occupation Suffolk lever corn and seed drill, price 16*l.* (this drill was awarded a prize of 5*l.* at the Society's show at Gloucester in 1853, also a prize of 5*l.* at Lincoln in 1854); a patent 9-rowed Suffolk lever corn drill, price 23*l.* 18*s.* 6*d.*, with steerage 4*l.* extra; a ten coulter Suffolk lever corn and seed drill, price 25*l.* 5*s.*, with steerage 4*l.* extra; an eleven rowed Suffolk lever corn and seed drill, price 27*l.* 10*s.*, with steerage 4*l.* extra; a patent ten and two rowed Suffolk lever corn and seed drill, price 30*l.*; a patent thirteen coulter Suffolk lever corn and seed drill, price 30*l.* 5*s.*, with steerage 4*l.* extra; and a patent fourteen coulter Suffolk lever corn drill, price 31*l.* 5*s.*, all invented, improved, and manufactured by the exhibiters.

William Wilson, of Penrith, Cumberland.

A French burr millstone dresser (new implement), price 9*l.*, manufactured by the exhibiter.

Young, Peddie, and Co., of 54, Hanover-street, near Edinburgh, Mid-Lothian.

A corn rick stand, 12 feet diameter, price 4*l.* 15*s.*; a grubber or cultivator, price 5*l.* 5*s.*; a drill grubber, price 3*l.* 3*s.*; a wrought iron sheep fodder rack, price 4*l.*; a wrought iron carriage gate, price 8*l.* 10*s.*; a wrought iron carriage gate, price 10*l.* 10*s.*; an improved wrought iron field gate, price 3*l.* 3*s.*, and a strong and cheap wrought iron field gate, price 2*l.* 3*s.*, improved and manufactured by the exhibiter; a "Gillespie's patent inclinometer," with sight telescope, price 3*l.* 13*s.* 6*d.*; and a "Gillespie's patent inclinometer," price 4*l.* 4*s.*, invented by William Gillespie, Esq., of Torbanehill, Bathgate, and manufactured by the exhibiters; a wrought iron garden chair, three-seated, price 1*l.* 10*s.*; a wrought iron garden chair, four seated, price 2*l.* 2*s.*; ornamental wire flakes, price 3*s.* 9*d.* per yard; strong and improved wire netting, galvanized, price 1*s.* to 2*s.* per yard; and an improved camp stool, price 6*s.* 6*d.*, improved and manufactured by the exhibiters.

Emerson Archer, of 13, St. Peter-street, Islington, London.

An improved oat and bean crusher, price 3*l.* 15*s.*; an improved oat crusher, price 3*l.* 15*s.*; an improved chaff cutter, price 3*l.* 15*s.*; and an improved chaff cutter, price 2*l.* 16*s.* 6*d.*, invented, improved, and manufactured by the exhibiter; an improved double weighing machine, price 4*l.* 10*s.*; an improved single weighing machine, price 2*l.* 10*s.*; an inverted weighing machine, price 2*l.* 15*s.*; and three domestic weighing machines, price 1*l.* 1*s.* to 1*l.* 16*s.*, invented, improved, and manufactured by W. L. Nicholl and Fowler, of 16, Aldersgate-street, London; an improved sack truck, price 15*s.*, invented, improved, and manufactured by the exhibiter; a new machine for paring apples, turnips, and potatoes (new implement), price 15*s.*, invented by Fowler, of Falkner-square, and manufactured by the exhibiter; an improved set of stable fittings, price 3*l.* 10*s.*, invented and manufactured by J. Barton, of 370, Oxford-street; a roll of patent felted sheathing felt, price 1*d.* per square foot, manufactured by Croggan and Co., of 2, Dowgate-hill, London; a roll of asphalte roofing felt, price 1*d.* per square foot; and a roll of inodorous felt, price 1*d.* per square foot, invented, improved, and manufactured by Croggan and Co., of 2, Dowgate-hill, London; a patent lever weighing machine, price 5*l.* 5*s.*, invented, improved, and manufactured by W. L. Nicholl and Fowler, of 16, Aldersgate-street, London; a rotary washing machine, price 2*l.* 10*s.*, invented by Eldridge, of London, and manufactured by Nicholl and Co., of London; and two pairs of hay steelyards, price 10*s.* 6*d.* each, manufactured by W. L. Nicholl and Fowler, of 16, Aldersgate-street, London.

William Herbert, of Oxford.

A water or liquid manure cart (new implement), estimated price from 10*l.* upwards, according to size, invented by the exhibiter, and manufactured by Richard Bach and Co., of Birmingham.

Kealy and Co., of 369, Oxford-street, London.

A patent vertical turnip cutter and root slicer, with double action (new implement), price 5*l.* 5*s.*; a machine for reducing roots to pulp (new implement), price 6*l.* 6*s.*; and a machine to reduce roots into shreds for mash feeding, price 6*l.* 6*s.*, invented by F. Kealy, and manufactured by the exhibiters.

William Trotter, of South Acomb, Bywell, near Newcastle-on-Tyne, Northumberland.

A fixed thrashing machine, price 60*l.*, invented by the Rev. A. Willison, of Dundonald Manse, improved and manufactured by James Stokoe, of Newton, and the exhibiter.

Edward Weir, of 16, Bath-place, New-road, London, Middlesex.

A double cylinder irrigator, liquid manure pump, and fire and garden engine, price, complete with joints to connect to pipes 10*l.* 10*s.*, suction pipe 2*s.* 6*d.* per foot, delivery ditto 7*d.*, copper branch pipe and spreader 10*s.* 6*d.*; a hose pipe reel, price, with three reels, to contain 400 feet of hose pipe, 7*l.* 7*s.*; specimens of canvas hose pipe, price 10*d.* per foot; an improved hose pipe joint for connecting lengths of canvas hose pipe, price 4*s.* 6*d.* to 16*s.*; a length of portable wrought

iron pipe for liquid manure or water, prices, at diameter of 1½ inch 1s. per foot run, 2 inches 1s. 8d.; a draining level, price 1*l.* 10s., case 1s.; and a workman's pendulum level, for use in digging drains, price 15s., all invented and manufactured by the exhibiter.

CHARLES BUNTING, of Halfway Houses, near Carlisle, Cumberland.

A winnowing machine, price £7, improved and manufactured by the exhibiter.

JOSEPH JAMES, of Old Town, near Hesket-in-the-Forest, Cumberland.

A pair of red freestone mill stones, manufactured by the exhibiter.

THOMAS MORLEY, of Gaitsgill, near Dalston, Cumberland.

An iron swing plough for two houses, price £5, improved and manufactured by the exhibiter.

WILLIAM HEAPS, of Forton, near Garstang, Lancashire.

A transversal seed harrow (new implement), price £11 11s., invented and manufactured by the exhibiter.

THOMAS GIBBS AND CO., the Seedsmen to the Royal Agricultural Society of England, corner of Half Moon-street, Piccadilly, London.

A collection of dried specimens of permanent grasses, containing all the kinds most useful in laying down land to permanent meadows and pastures; a collection of specimens of wheats, barleys, oats, &c., in ear, including all the kinds in general cultivation in England; a collection of samples of various permanent and other grass seeds; a collection of general agricultural and other seeds; and a collection of roots of Orange Globe and other mangel wurzels.

GEORGE BRUCE, of Liverpool.

A specimen of black japan varnish, price 5s. per gallon; a specimen of blue-coloured composition, price 15s. 6d. per gal.; a specimen of a red-coloured composition, price 15s. 6d. per gallon; a specimen of a green-coloured composition, price 15s. 6d. per gallon; a specimen of a stone-coloured composition, price 15s. per gallon; a specimen of traneparent varnish, price 7s. per gallon; and a specimen of white colourless varnish (new), price 16s. 6d. per gallon—all invented, improved, and manufactured by the exhibiter.

GEORGE CHIVAS, of Chester.

An Orange Jelly Turnip, price 2s. per lb.

HARE AND CO., of 31, Essex-street, Strand, London.

A pair of Rice's patent No. 1 steel spring links for leather cart trace, price 6s. per pair; a pair of Rice's patent No. 2 steel spring links for chain trace, price 6s. per pair; and several pairs of Rice's patent India-rubber and patent steel spring links, price 6s. to £1 5s. per pair—all invented and manufactured by William Rice, of Boston.

JOHN HEWITSON, of Glasgow, Larnarkshire.

A set of plain leather cart harness, price £7; and a patent leather set of cart harness, price £12 12s.—both improved and manufactured by the exhibiter.

JACKSON AND CO., of Seaton Fire-brick Works, near Workington, Cumberland.

A cow trough, price 4s. 6d.; and a horse or pig trough, price 3s. 9d.—both invented by Thomas Jackson, of Seaton Mill, and manufactured by the exhibiters.

WILLIAM HALL, Agent for George Lee Baxter, of Sneinton, near Nottingham.

A model of a reaping machine (new implement), price £25, invented, improved, and manufactured by G. Lee Baxter.

JAMES TREE AND CO., of No. 22, Charlotte-street, Blackfriars-road, Surrey.

A cattle gauge and key to the weighing machine, price (with book of instruction for use) from 4s. 6d. to 17s.; a cattle gauge adapted for any market, price (with book of instruction for use) from 8s. 6d. to 21s. each; and a circular cattle gauge, price (with book of instructions) £1 10s.—all invented by Mr. Ewart, of Newcastle-on-Tyne, and improved and manufactured by the exhibiters.

ROBERT NANSON, of St. Albans-row, near Carlisle, Cumberland,

A riding saddle complete, price £5 5s., and a cow-headed side saddle complete, price £13—both manufactured by the exhibiter; a set of embossed brown gig harness complete, price £8 10s., invented and manufactured by the exhibiter; and a set of cart harness complete, price £4 10s., manufactured by the exhibiter.

DESTRUCTIVE BIRDS.—We rejoice to learn from several quarters, that our remonstrances for the destruction of birds and vermin of a predal nature have met the views of many of our distant friends, and that several in our own neighbourhood are joining heart and hand in the cause, using every effort in their power for the annihilation of these pests before the coming harvest. Although no clubs are yet established for this purpose in our own immediate vicinity, yet that small birds of a destructive character are already diminished to a certain extent is apparent from the fact of our seeds (their favourite dainties) not being attacked as in former seasons. Now is the time to persevere, as every pair of old birds killed now, tells for ten in the autumn; although the sad affair in the Crimea will scarcely admit of a joke, let us hope that sufficient powder and shot will be left at home for this purpose, and will be fraught with better results than the contingencies of the war. By shooting, and other projects, those not killed will soon disperse off our own premises and migrate from us to different parts or other homesteads, where they are not molested, and where they may be called as much belonging to them as us, and where, if the proprietors choose to foster them, they may, and decoy them if they please, and enjoy the fun of seeing them eat up their corn and seeds at their own expense. Our neighbours should bear in mind that their *own* pigeons are sometimes seen feasting on other people's lands, when they are not at all welcomed. If we may be allowed to digress a little, and turn politicians, we would just say, "let us go on stimulating each other by precept and example, like true patriots, and by the end of harvest a great saving will be effected favourable to our own interests and the nation's weal." We will just observe, by way of illustration, what probable saving may be effected by such a course being energetically and fully carried out. Speaking within bounds, we will suppose *only* one peck of grain or seeds to be demolished on every acre in England and Wales alone in one year by destructive birds, rooks, and vermin. Parliamentary statistical reports for 1854 have been published, and it appears that the following number of acres under tillage for corn in England and Wales (to say nothing of Ireland and Scotland) was—wheat, 3,807,846 acres; barley, 2,667,776; oats, 1,302,782; rye, 73,731; making a grand total of 7,852,135—say 8,000,000 acres, by including all kinds of seeds. It thus follows, that at this moderate calculation, one peck per acre only (and how often is there much more, nay even half consumed or spoiled on small plots, and in cottagers' gardens?), 2,000,000 bushels are actually destroyed by birds, &c., every year! No mean consideration this, we think (coupled with other sad wastes of corn alluded to in a former paragraph) in a time of scarcity, and when war is inevitable.—HARDY AND SON, Seed-growers, Maldon, Essex, July 14, 1855.

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weat'r.
1855.	8 a.m in. cts.	10p.m. in. cts.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p.m.	10p.m.	
May 22	29.87	29.87	45	62	49	West	gentle	cloudy	fine	fine	dry
23	29.87	29.80	43	56	48	S. var.	lively	cloudy	cloudy	fine	dry
24	29.79	29.82	46	70	58	S. by West	fresh	cloudy	sun	fine	dry
25	29.83	29.80	49	77	64	S. by E.	fresh	cloudy	sun	fine	dry
26	29.90	29.84	54	80	62	S. by E.	brisk	fine	sun	fine	dry
27	29.80	29.73	55	69	55	E. by N.	brisk	cloudy	sun	fine	showery
28	29.83	29.90	52	56	49	North	fresh	cloudy	sun	fine	rain
29	29.90	29.90	42	55	41	N. by W.	lively	cloudy	sun	fine	dry
30	29.90	29.90	41½	46	42	North	lively	fine	sun	fine	rain
31	29.70	29.50	41	53	50	N. E., S. E.	var.	cloudy	cloudy	fine	rain
June 1	29.70	29.99	45	53	46	S. W.	airy	cloudy	fine	fine	dry
2	29.98	29.97	41½	63	46	W. by S. & N.	gentle	cloudy	fine	fine	dry
3	29.91	29.91	41	61	51	S. by W.	airy	fine	sun	cloudy	dry
4	29.88	29.90	50	64	55	S. by W.	strong	cloudy	cloudy	cloudy	dry
5	29.91	29.88	52	69	62	S. by W.	airy	cloudy	sun	fine	dry
6	29.88	29.73	60	78	70	S. or by East	brisk	fine	sun	cloudy	dry
7	29.88	29.94	56	70	55	S. by W.	gentle	cloudy	fine	fine	showery
8	20.94	30.0	52	67	57	S. by W.	fresh	cloudy	sun	fine	dry
9	30.01	30.12	51	64	52	S. by W.	fresh	fine	cloudy	cloudy	showery
10	30.22	30.22	48	70	57	S. by W.	fresh	fine	sun	fine	dry
11	30.22	30.20	52	65	58	E. N. E.	brisk	fine	sun	clear	dry
12	30.15	29.94	51	66	60	E. N. E.	brisk	fine	cloudy	cloudy	dry
13	29.73	29.51	55	71	55	S. West	brisk	fine	fine	clear	rain
14	29.45	29.58	51	64	55	S. West	brisk	cloudy	fine	cloudy	showery
15	29.38	29.35	50	63	52	S. West	brisk	cloudy	sun	cloudy	showery
16	29.35	29.45	46	64	50	Westerly	var.	cloudy	fine	cloudy	dry
17	29.33	30.03	47	57	47	North	lively	cloudy	fine	fine	dry
18	30.11	29.86	42	56	54	S. West	brisk	fine	cloudy	cloudy	rain
19	30.01	30.33	40	63	47	N. by W.	brisk	cloudy	sun	fine	dry
20	30.33	30.35	39	60	49	N. N. E.	brisk	fine	sun	fine	dry
21	30.34	30.29	39	65	56	North	brisk	fine	sun	fine	dry

Estimated Averages of June.

Barometer.		Thermometer.		
Highest	Lowest.	High.	Low.	Mean.
30.46	29.60	90	37	58.7

Real Average Temperature of the Period.

Highest.	Lowest.	Mean.
63.77	47.9	55.825

Weather and Phenomena.

May 22. Cloudy.—23. Fine.—24. Same till 2 o'clock, then some drops of rain.—25. Summer heat; brilliant.—26. Doubtful; very hot.—27. Some showers.—28. Cool, and overcast.—29 Heat and rain.—30. Cold, driving showers.—31. Several hours' rain.

Lunation.—First quarter, 24th day, 0 h. 2 m. morning. Full Moon, 31st day, 2 h. 48 m. aftern.

June 1. Clearing.—2. More genial.—3. More sun; balmy.—4. Frequent driving showers, of no continuance.—5, 6. Fine.—7, 8, 9. Showery, producing 8½ cents. of rain, and some wind; again dry and cool till—14, 15, 16. Very changeable; much sun.—17. Fine.—18. Night rain copious; in these five days 0.34 cents. of rain are registered here.—19, 20, 21. Settled, fine weather.

Lunations.—Last quarter, 7th day, 7 h. 48 m. morn. New moon, 14th day, 2 h. 29 m. afternoon.

Remarks connected with Agriculture.—An apology is due to the readers for the omission of this diary in the previous number. It was occasioned by mere oversight at the particular moment when the manuscript should have been forwarded; the circumstance will, it is hoped, never occur again. The low temperature of the period has certainly tended to retard growth and vegetable development; yet the prospects are promising, and more will be said on this subject in the next diary. At present, the potatoes are in the finest condition possible. The drought of the season is certainly great, and only 0.61 cents. of rain fell in June to the 22nd day.

Croydon, July 17. J. Towers.

METEOROLOGICAL DIARY.

1855.	Barometer. 8 a.m. in. cts.	Barometer. 10 p.m. in. cts.	Thermometer. Min.	Thermometer. Max.	Thermometer. 10 p.m.	Wind. Direction.	Wind. Force.	Atmosphere. 8 a.m.	Atmosphere. 2 p.m.	Atmosphere. 10 p.m.	Weat'r.
Jun. 22	30.27	30.17	42	70	62	N. by E.	airy	fine	sun	fine	dry
23	30.17	30.23	58	63	52	N. by E.	close	cloudy	cloudy	cloudy	dry
24	30.26	30.26	50	71	58	N. West	airy	fine	sun	fine	dry
25	30.17	30.14	51	67	58	Westerly	strong	fine	sun	fine	dry
26	30.20	30.30	55	75	61	W.N.W.	gentle	fine	sun	fine	dry
27	30.38	30.35	59½	80	64	E. by N.	calm	fine	sun	fine	dry
28	30.33	30.20	53	75	62	E. by N.	fresh	fine	sun	fine	dry
29	30.15	29.98	55	77	65	E. by N.	fresh	fine	sun	cloudy	dry
30	29.98	30.11	62	75	59	S. West	fresh	fine	sun	fine	dry
July 1	30.18	30.20	55	74	64	S.S.W.	brisk	fine	sun	fine	dry
2	30.21	30.21	60	77	65	S.S.W.	gentle	fine	sun	cloudy	showery
3	30.21	30.20	60	76	70	N. and N.W.	gentle	cloudy	sun	cloudy	dry
4	30.17	30.14	64	72	60	N. and N.E.	airy	fine	sun	cloudy	dry
5	30.16	30.08	48	76	63	E. to S.E.	calm	fine	sun	cloudy	dry
6	30.08	30.08	53	73	62	S. East, S.	gentle	haze	sun	cloudy	dry
7	30.08	30.08	55	69	59	N. East	gentle	haze	sun	cloudy	dry
8	30.05	29.91	56	73	64	N. East	lively	fine	sun	cloudy	dry
9	29.31	29.68	59	74	65	Var.	airy	cloudy	cloudy	cloudy	rain
10	29.67	29.61	61½	70	65	S.W.	gentle	cloudy	fine	cloudy	showery
11	29.60	29.60	57	62	60	North	gentle	cloudy	cloudy	cloudy	showery
12	29.73	29.88	59	73	65	N. West	gentle	cloudy	sun	fine	dry
13	30.00	30.00	60	75	65	S. West	airy	fine	sun	fine	dry
14	29.89	29.95	58	74	60	S. West	airy	fine	sun	clear	dry
15	29.95	29.90	58	77	62	S. West	lively	fine	sun	cloudy	dry
16	29.67	29.55	58	72	54	S.W., N.W.	lively	cloudy	cloudy	fine	rain
17	29.55	29.70	50	69	58	N. Westerly	var.	cloudy	fine	fine	dry
18	29.74	29.78	55	75	61	W. and by S.	lively	fine	sun	fine	dry
19	29.71	29.63	56	64	55	S. by West	var.	fine	sun	fine	showery
20	29.78	29.95	51	73	61	N. West	gentle	fine	sun	fine	dry
21	30.06	30.17	51	76	62	N. West	gentle	fine	sun	fine	dry

Estimated Averages of July.

Barometer. Highest.	Barometer. Lowest.	Thermometer. High.	Thermometer. Low.	Thermometer. Mean.
30.300	29.380	70	42	61

Real Average Temperature of the Period.

Highest.	Lowest.	Mean.
72.56	55.66	63.11

Weather and Phenomena.

With the exception of a few drops on the 23rd, the weather has been fine.

Lunations.—First quarter, 22nd, 4 h. 52 min., p.m.; full moon, 20th, 11 h. 14 min., p.m.

July 1. Lively summer day.—2. Close; a mere sprinkle, not measureable.—3, 4. Warm and forcing.—5. Summer heat.—6, 7. Fog early; hot days.—8. Fine, and still dry.—9, 10, 11. Rainy period and mild temperature; rain fallen 2 in. 29 cts.—12, 13. Very fine.—14. Thunder at 6 a.m.; distant, but very severe elsewhere.—15. Superb lively day; change indicated.—16. Repeated showers, 4 in. 51 cts.—17, 18. Fine.—19. Several showers; one with thunder.—20. Fine balmy day.—21. Complete summer forcing day.

Lunations.—Last quarter, 6th, 1 h. 28 m. p.m.; new moon, 14th, 4 h. 1 m. morn.; first quarter, 22nd, 7 h. 50 m. morn.

Remarks connected with Agriculture.

What hay there was has been made and carried in perfect safety, and subsequently the grass and meadows have been effectually refreshed by more than two inches of rain, and verdure succeeds to drought and aridity. The potato plant exhibits a most perfect growth, and the rain has caused a rapid growth of the tubers. The wheat was first seen in ear (by me) on Midsummer day; in some places it is said to have been observed a few days earlier. The flowering season was safely passed, and now the plant is strong and beautiful. The spring corn is also greatly improved. If the weather remains propitious, the harvest will not be late.

John Towers.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JULY.

It is most gratifying for us to be enabled to lay before our readers an unusually favourable report of the progress and prospects of the grain crops. Aware as we are that our statements have invariably great influence, not only upon the price of wheat, but likewise upon the value of national and other securities—for it must be admitted that a short supply of produce in this country invariably leads to a large export of bullion, to the consequent derangement of our monetary system, and to a great stringency in the discount market—it may be necessary to state that we have carefully collected facts from nearly all quarters of the kingdom, which facts are borne out by practical judgment and experience. Our present position with Russia, and the total cessation of all shipments of grain and flour from the United States, if we except Indian corn, have kept alive a degree of feverish anxiety seldom witnessed even at this period of the year—the public, as well as the agricultural body being fully convinced that a short crop of wheat in this country during the present season would prove most disastrous in its consequences. Upon so important a subject, therefore, it becomes absolutely necessary that great caution and judgment should be exercised, in giving publicity to opinions which may not be based on sound and honest principles. With very few exceptions, our correspondents state that the wheats were never looking more promising than at present, that the blooming time has passed off remarkably well, and that the extent of wheat laid by the late heavy rains has been by no means extensive—in point of fact, whether we consider the crops on the light or heavy lands, there is no indication of scarcity anywhere, or even of only a moderate return. From the present aspect of the fields, we are bold enough to assume that we shall grow as much wheat this year as we did last; and were it necessary, we could adduce numerous instances of *inferior soils* showing a probable yield of *five quarters* to the acre. In offering these remarks to our readers, we firmly believe that we are in no way exaggerating the truth; but, of course, some weeks have yet to elapse ere more definite information can be procured. At present, however, everything is in favour of a large return. In considering the crop of barley, one or two observations are necessary. In what may be termed the barley districts, the growth appears to be unusually abundant; but we are somewhat apprehensive, from the immense breadths which have been laid, that there will be a great deficiency in colour and quality; hence, fine parcels may turn out scarce and dear. As to quantity, however, there is no question but that it will be very extensive. The oat crop has progressed well upon the heavy lands; but upon light soils, the yield will, we apprehend, prove a light one. As regards beans and peas, we have no particular complaints to make; but, when we consider the small extent of land under cultivation this year, anything approaching a large return appears to be very doubtful.

The next matter claming the most serious consideration, as bearing upon price, is the amount of produce now in the hands of the farmers to meet consumption until after the close of harvest operations, and the extent of the supplies which are likely to reach us from abroad in that period to meet our additional wants. From the most careful inquiries on the first head, we may intimate that the quantity of wheat still on hand is considerably in excess of some estimates: indeed, we feel convinced that it is considerably larger than at the corresponding period in 1854, and fully equal to the supply in 1853. It is not for us to say that wheat will not be dearer, during the approaching month; because any change in the appearance of the crop to which so much attention is now directed would be productive of great excitement in the trade. But when we look at the steady importations from Spain, Egypt, and the Lower Baltic ports, added to the trifling export inquiry, the most reasonable inference is that the demand will be easily met, though it may leave us with a very limited supply of old wheat on hand in September next.

The greater portion of the crop of hay has now been cut, and carried in for the most part, good condition. The quantity secured this season is the smallest ever known; yet we find that there is an excellent prospect of a good second crop, which is likely to prove heavier than the first. Hay has been selling at a very high price—prime old meadow having realized in the Metropolitan Market £6 10s., and new £5 5s. per load. These prices—should they extend throughout the country—must have considerable influence upon the value of live stock.

As regards the potato-crop, our advices are most cheering. In those districts which principally sup-

ply the London market, scarcely any traces of disease are to be met with; and we feel justified in asserting that fewer losses are likely to be experienced in other quarters than were ever known.

The growth of all kinds of potatoes was much checked in the early part of the month, from the want of moisture; but since the fine rains have fallen, they have made rapid progress, and supplies have increased both in size and quality. As the quantity of land under potato-culture is surprisingly large, an extensive yield for winter consumption may be pretty safely calculated upon. The imports of foreign potatoes during the month have been about 3,000 tons.

From the hop districts, unusually favourable advices have reached us. The bine is looking remarkably well, and one of the largest growths ever recollected is fully expected to be collected. The hop trade has, consequently, with the duty calculated at £250,000, ruled excessively heavy, and prices have declined from 20s. to 30s. per cwt. The arrivals of foreign hops have been about 1,500 bales, chiefly from New York.

Notwithstanding that the quantity of wool advertised for the colonial sales now in progress (and which are going on well, at an advance of 1s. per lb., compared with the former series) is unusually extensive—72,000 bales. English wools, under the influence of an easy money market, have sold to a considerable extent, and prices have steadily improved. The fat stock markets have been scantily supplied, and rather an important advance has taken place in the quotations. The imports from the continent have been considerably short of some former years.

In Ireland and Scotland, the corn and cattle trades have been tolerably active, and prices have generally improved. We understand that the stocks of grain on hand and likely to be forwarded to England during the remainder of the season, are very moderate.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Compared with several corresponding months, the supplies of fat stock on sale in the whole of our leading markets, but more particularly in the metropolis, have been very moderate, and extremely deficient in quality. The continuance of extremely hot weather having prevented country-slaughtering for London, the consumption has been wholly met by the graziers, whose present ability to forward additional numbers of either beasts or sheep appears to be somewhat doubtful. Some time since, we intimated that, in the event of consumption progressing steadily, we should have meat dearer than it then was; and the events of the month just concluded have fully warranted the assertion. We have beef now worth in the Metropolitan Market 5s. 4d. per 8lb., live weight, and mutton nearly or quite as dear. These are enormously high rates; and it has become a serious matter for consideration on the part of consumers, whether the highest point has even yet been reached. To determine this important question, it is necessary that we should obtain information on the subject of future supplies. Evidently—without venturing the assertion that we shall have famine prices—our graziers are not in a position to meet the enormous consumption going on; and hence, it may be deemed judicious to review the results of our long-continued drain upon the Continent. That drain has unquestionably produced an amount of fluctuation in prices here, at one time rendering grazing a most unprofitable business, at another producing dear markets, as is the case at this moment, from a great falling off in the shipments to this country. We cannot for a moment suppose that we shall receive supplies from Holland, during the remainder of the year, equal to those hitherto reported, because our information on this head is of a most decided character—viz., that good stock is very scarce in nearly all parts of the Continent, and that prices there are too remunerative to admit of additional exports. Thus we find that the value of home-fed stock is not likely to be regulated by the foreigner; consequently, though prices may fluctuate *considerably*, that a low range in prices is wholly out of the question: indeed, in our opinion, grazing is likely to prove a source of considerable profit for many months. But, to counterbalance large gains, we must make considerable allowance for the small supply of hay which has as yet been grown this year, and the high prices paid for artificial food. And here, we may venture to disabuse the minds of our readers respecting the supply of cake, founded upon an assumed falling off in the import of linseed. As yet, the war with Russia has had the effect of greatly increasing the arrivals of that article; and this will be evident when we state that the imports this year have been not less than 183,179 qrs., against 100,127 do. last season. Those of rapeseed have exceeded 79,000 qrs., against 39,397 do. in 1854. The great increase in the supplies has been from India, which country will, shortly after the further extension of railway communication, be in a position to supply the whole world with linseed, to the exclusion of all supplies from Russia. Cake, therefore, with such abundant supplies, can hardly become dearer than it now is.

It has been a general subject of complaint amongst the butchers that the sheep have carried

an unusually small quantity of internal fat; and we know numerous instances in which severe losses have been met with from this circumstance. This remark will be obvious when we state that, in the Metropolitan Cattle-market held on the 23rd of the month, there were not 5,000 really good and well-made-up sheep on sale. This falling off in the supply of fat has been productive of increased firmness in the tallow market, with a corresponding rise in prices; yet unquestionably that firmness must be traced to the fact that tallow is now from £5 to £10 per ton dearer in Australia than in the London market, arising from the great demand which has lately sprung up for candles in the colony.

In Norfolk, Lincolnshire, &c., the health of both beasts and sheep has continued good; indeed, we have heard of very few losses from disease. The late fine rains have been productive of a more plentiful supply of pasture herbage. In this respect, the stock is doing well.

The following have been the imports of foreign stock into London:

	Head.
Beasts	2,840
Sheep	15,680
Lambs	997
Calves	1,794
Pigs	1,369
Total	22,680
Corresponding month in 1854	22,242
Do. do. 1853	38,795
Do. do. 1852	27,008
Do. do. 1851	24,082

From the above comparison, it will be seen that our former estimates of the future imports into this country have been realized. We should not be at all surprised to see a further falling off in them, as the demand for and import of Dutch and Spanish stock into France are very extensive. It is somewhat remarkable that France has now become as large an importing country as ourselves.

The annexed supplies of stock have been exhibited in the Metropolitan Market:

	Head.
Beasts	16,702
Cows	535
Sheep and lambs	149,470
Calves	2,757
Pigs	4,000

SUPPLIES AT CORRESPONDING PERIODS.

	1854. July.	1853. July.	1852. July.
Beasts	19,740	21,199	18,404
Cows	540	560	680
Sheep and lambs	157,970	169,920	160,190
Calves	4,123	4,315	3,476
Pigs	3,110	2,820	3,067

The supplies of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 5,200 Scots and shorthorns; from Lincolnshire, 2,000 shorthorns; from other parts of England, 1,000 of various breeds; from Scotland, 840 Scots; and from Ireland, direct by sea, 145 beasts.

Beef has realized 3s. 6d. to fully 5s. 2d.; mutton, 3s. 6d. to 5s. 2d.; lamb, 4s. 10s. to 6s. 2d.; veal, 4s. 2d. to 5s. 4d.; pork, 3s. 4d. to 4s. 6d. per 8lb., to sink the offals.

COMPARISON OF PRICES.

	July, 1854. s. d.	s. d.	July, 1853. s. d.	s. d.	July, 1852. s. d.	s. d.
Beef	3 2	to 5 0	3 2	to 5 0	2 4	to 3 10
Mutton ..	3 4	to 5 0	3 6	to 5 4	2 8	to 4 0
Lamb	4 4	to 5 8	5 0	to 6 4	4 2	to 5 2
Veal	3 2	to 5 0	3 6	to 5 0	2 6	to 4 0
Pork	3 0	to 4 8	3 0	to 4 2	2 6	to 3 8

Very limited supplies of meat have been on sale in Newgate and Leadenhall. Good clearances have been easily effected, on the following terms: Beef, from 3s. 4d. to 4s. 8d.; mutton, 3s. 4d. to 4s. 10d.; lamb, 4s. 8d. to 5s. 10d.; veal, 3s. 10d. to 4s. 10d.; pork, 3s. 8d. to 4s. 6d. per 8lb., by the carcase.

CUMBERLAND.

The long-continued, cold and dry weather, which was so very unfavourable for vegetation, and caused many a farmer to look anxiously for a change, was, on the contrary, all that could be desired for getting the land well cleaned and properly prepared for the reception of the seed. The severe frost made the land intended for oats exceedingly friable, and in excellent order; and the seed was got in under very favourable circumstances. Notwithstanding that the frost continued so severe that the harrows could not work during the early part of the day, the oats came well, with scarcely a complaint of being grub-eaten. The dry weather that had continued so long was beginning to tell upon them when the rain came, but now they wear the appearance of being a good crop. The state of the weather gave every opportunity of bringing up the arrears of work caused by the long protracted winter. The opportunity was not missed, and the potato planting and turnip sowing were completed in good time. Potatoes came well, and up to this time give promise of being a good crop. There was a large breadth put in, and should they escape the disease, they will be both plentiful and cheap. But should the season turn out to be a wet one, there is too much reason to fear that the potato crop will suffer severely. The rain came very opportunely for turnip sowing. They generally came very well, and were not much troubled with the fly, which was rather checked by the cold weather, and did not succeed in injuring the plant much, except where the land was too stiff, and not sufficiently pulverized. But this was not in any quantity, and the crop generally promises well. The fine showers and the seasonable change in the temperature have had a very beneficial effect upon the grass land. And where the land is in condition, and not too late eaten, some very good crops of lea hay will be produced; but too many were compelled, by want of keep for their stock, to eat their seeds too long, and many light crops will be the consequence. Meadows being later, have an opportunity of benefiting more by the recent rains. At present the weather is very bad for haymaking, the two or three last days having been exceedingly wet, with every appearance of continuing; and if it does so, it will be very unfavourable for the wheat during the critical process of blooming. The wheat plant perhaps never suffered more from the ravages of the wireworm than this season. Much was very seriously thinned out; and although the superficial observer, by looking over the hedge or the gate, may, from its green healthy appearance at a distance, go away with the conviction that it looks very promising for a good crop, if

he would only walk through amongst it he would soon change his opinion. Indeed, where it is thus thinned, it usually wears a greener, richer hue. The harvest seemed likely all along to be a late one. The late forcing weather had a very good effect in pushing forward the crops, but should weather like what there has been these last two or three days continue, the harvest must necessarily be late. Barley is likely to be a good crop. The late rains have had a very beneficial effect upon grass land, and keep for stock has for some time back been comparatively plentiful. This necessarily tends to keep up the price of store cattle and sheep, and fat continues to bring high prices. Sheep are rather more plentiful, but beef continues very scarce. The scarcity of keep during spring and the early part of summer, and the high price of fat, caused a great many, both cattle and sheep, to be brought to market before they were more than half fat; thus requiring so many more to supply the demand than if they had been properly fattened. This necessarily tends to prolong the scarcity. Lambs have been pretty numerous, and are doing well; but on the mountains and high lands it is said that, owing to the ewes being in such a poor state from the want of keep during the very severe weather in winter and spring, the loss of lambs by death has been very great. The markets for all kinds of grain have been very firm. Last week wheat showed a tendency to improve in price, and met with a very quick market; barley, too, maintains its price, with rather a better market last Saturday. The same may be said of oats, which were rather duller of sale a few weeks back. Young pigs are selling at high prices; good ones, from eight to nine weeks old, fetching from 20s. to 25s. each. Sheep-shearing is about finished; and the demand for wool has been good, with an advance upon the price given last year.—July 18.

NORTH NORTHUMBERLAND.

We have the pleasing duty at last to report the enjoyment of summer weather, wheat coming out into ear on all favoured situations; but the greatest breadths are yet in the flag leaf, and will require a week or ten days before a full development can fairly be expected. A general thinness of plant is very much complained of, even on the finest and most skilfully cultivated localities. It is also pleasing to see on higher levels fields luxuriantly promising; such, however, are only exceptions; and particularly when so much depends on a good blooming and maturing season. We can only at this stage hurriedly report the "wheat crop" healthy—late, with a full moiety unusually thin of plant. Barley promises best of our cereals, the early-sown pushing out a good, long ear. Oats suffered much from the deluge of rain which fell over this northern district on the 15th and 16th of June. On the latter day rain fell in torrents for several hours, with a cold north-easterly wind; consequently the soil has become battered, and hard as brick-earth, which has stunted the growth of the oat, causing a sickliness of colour. From the same cause, turnip sowing has been retarded; the process both tedious, slow, and expensive; the braird partial; portions resown, and others ploughed up, with no chance of reducing the soil to a "turnip tilth" for this season. We apply only such remark to deep loams and tenacious subsoils. On the light friable soils the plant has beat the fly, and large breadths are singled out. We cannot at any rate expect a full turnip crop. Potatoes look well, and a full breadth planted. Hay cutting has just commenced over the young artificial grasses; crop falls very light. Old meadows will cut up quite the reverse of a full or bulky return. Pastures, which were unusually bare of feed up to the last of June, are now carrying a full bite; and live stock of all descriptions healthy, grazing with a full bite. Labour scarce, and full wages for all willing workmen.—July 15.

CORNWALL.

We have had a variety of weather since our last report Some hot, dry, sunshiny days for about a fortnight or more, and also some boisterous, rainy weather. Those who were fortunate enough to cut their hay early had a fine time for saving it; but there were very few who could do this, as the general crop was quite backward, and is thin and light, more particularly perhaps the clovers and all artificial grasses. Mowing became general about the 4th and 5th inst., but rain set in on the 8th, and up to the time at which we write we have had a succession of heavy rains, which have seriously injured a large quantity of hay. The wheats are all backward; those that came first into ear had the benefit of the fine weather; but during the last ten days it has been a very unfavourable time for their blossoming: we observed a large portion, so late as the 10th inst., not in ear. On the whole, both barley and oats are looking pretty well, and promise a good harvest. Mangels are throughout unusually fine, and their healthy vigorous appearance is a subject of general remark; a large breadth has been planted. The early-sown swedes were almost entirely destroyed by the fly, and other varieties of turnips have suffered severely from the same cause. Re-sowing and patching again and again has been generally resorted to; and with all this extra expense and trouble, a promising crop is rarely to be seen; indeed we never remember seeing more damage from the fly for the past twenty years. Carrots are looking well, and cabbages also. The pastures are now looking very fine, the late rains having improved their appearance amazingly. Cattle, however, are not generally up in condition. Fat beasts and sheep are scarce; the former sell at 65s. to 70s. per cwt., the latter 6½d. to 7d. per lb. The high prices we have had for some months past have caused a falling off in the consumption, although labourers are in good employ at remunerative wages. Our corn markets are now solely governed by Mark-lane, which for some time to come will vary with the weather. A late harvest is now certain, although in some districts it will be much earlier than in others. A full supply of potatoes is now brought forward; the crop is good; as yet we have seen no symptoms of disease, though we have heard it has made its appearance in some localities. Apples are a partial crop: some orchards have a fair quantity, but the majority have scarcely any, and the trees are much blighted.—July 19.

SOMERSETSHIRE. — WEATHER AND CROPS.—Our wheat, looking the strongest and most promising for a heavy crop, was laid by the storm on the 13th or morning of the 14th, and it has not since risen. This applies pretty generally to all our best wheat soils, and will affect the quantity and quality. We hear as yet of no blight; the ears are large, and well filled apparently, but very backward. The earliest districts and pieces we do not expect to be fit for cutting before the middle of next month. There has been, since the thunder, a coldness that makes the progress anything but forcing. Barley is more laid than wheat. Beans have, in some localities, the black blight: not more than an average crop. Oats look well. The rain has improved the prospect of the uncut grass, as to weight, lately. The hay has been starved, but some very prime has been got together; 30 tons where 50 tons have been cut, is not uncommon; in some localities the weight has been full two tons per acre, but this is rather an exception. We had plenty of heavy rain yesterday morning; to-day is fine, with cold north-west wind. Potatoes do not grow fast, but the haulms are yet strong and look well.—July 21.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

CAITHNESS GEORGEMAS CATTLE MARKET.—There was a tolerable clearance effected, and on sheep at an advance of about 1s. 6d. a-head on last year. Cattle scarcely realized last season's prices, but the rates paid left little room for the disposer to complain. In milch cows few good were exhibited, and the prices asked were high. The same may be said of horses: a few superior animals were shown, for which from £30 to £45 were asked, but not much business in this department. Altogether the market was considered good, and the stock, as regarded quality, seldom surpassed. Wool is still 10s. per stone under what it was this time two years—a consequence of the war, we believe; but there is some prospect of an advance not very far distant.

EXETER LAMMAS FAIR.—A very small supply of cattle as compared with the number we have seen in former

years, which may be partly accounted for from the fact that the farmers are busily employed in harvesting their hay. Many bullocks, in excellent condition, were driven in, and these sold at 12s. per score, the quotations varying from 11s. to 12s. Cows and calves were from £12 to £15; barreners, 5s. 6d. to 6s. 6d. per score. Wethers, 6½d. to 6¾d.; ewes, 6¼d.; lambs, 7d. to 7½d. per lb.

MUIR OF ORD MARKET.- The total number of Highlanders brought forward might be about 500 or 600, and of crosses from 120 to 170. They sold generally at rates varying from £3 10s. to £5 10s. each. Some of the Caithness Highland stock sold at a much higher figure—as much as £8 having been freely given for one of the best lots of Highland queys. Two-year-old crosses sold at from £14 to £16, and some choice beasts, in small lots, at £17 and upwards. The show of horses was large, and prices ruled high.

ROSS FAIR was moderately supplied with fat cattle; trade not quite so brisk as usual. A large quantity of fat sheep met with a ready sale at 7d. per lb.; inferior animals were not much sought after —The horse fair was well stocked with a large quantity of inferior quality, but were not in much demand; the few good ones met with a brisk sale.

ST. BOSWELL'S LAMB FAIR.—This great annual market, the most important in point of quality, was held on Wednesday last, on St. Boswell's Green. The stock being early placed, and equally early looked after on the arrival of the special trains from different places on the North British line, sales began to be effected early. The flocks appeared in fair condition, considering the severe season they had to contend with, and would have looked even better had it not been for the heavy rains which have fallen within these few days. That which fell in several districts, on their way to the market, had the effect of taking a little off their real value in point of appearance; but towards seven o'clock A.M., the weather having broken up, the stock had wonderfully mended in appearance. It was composed of three parts half-breds, and a sprinkling of Cheviots; but the short supply of the latter description arose from the short keep on the hills during last winter. Between five o'clock and seven o'clock a very considerable number of sales were made amongst the bred, &c., stocks that were known to dealers; although a few others, not so celebrated, were also picked up early. The buyers were numerous from all parts of the country, the bulk of the extensive southern dealers having been on their way from the Inverness annual market. The unprecedented rise upon this description of stock is without a parallel, the three-quarters breds bringing so high a price as 25s. 6d. The rise from last year, upon the bred and three-quarter sheep, would be about 3s. per head; for the half breds, and the few Cheviots that were exposed, 1s. 6d. to 2s. The Cheviots that should have appeared at this market will, in all probability, appear at Melrose on the 12th of August. At the close of the market a few lots were driven off unsold, but this arose from the extravagant prices that were asked and stuck to, because many dealers left the ground only partially supplied. There is no doubt that the stimulus given to this market arose from the well-timed rains which brought the grass forward at a time when it was supposed in many cases to be hopeless. There was a very superior show of milch cows, which met with a ready sale, composed of short-horned and Ayrshire cattle. There was a great demand for short-horned cows which were in calf, about to calve, or had calved; first class short-horns from £15 to £20; second class, £10 to £12; Ayrshire ranged from £8 to £13, and even down to £7. A good number of each, particularly Ayrshire, remained unsold. There was a fair show of Irish two-year-old cattle, which met with a tolerably good sale, at prices no higher than recent markets. Store cattle: The following are a few of the lots of this kind that were disposed of:—Mr. Swan sold a lot of two-year-old shorthorns at £13 10s.; another lot to Mr. Dawson, Linlithgow, at £11 5s.: a lot to Mr. Thom, Fife, at £11; another lot at £9; also a lot to Mr. Wright, Corstorphine, at £9 5s. Mr. Leithead, Galashiels, got for two-year-old shorthorns £11; a lot of stirks sold at £9 10s.; another lot at £9 15s. A number of these beasts remained unsold.

ST. COLUMB CATTLE MARKET.—Fat bullocks were not so numerous as usual, but those in good condition met a ready sale at prices from £3 5s. to £3 10s. per cwt. The sheep market was well stocked, and there was a brisk sale at about 6½d. per lb. The supply of cows and calves was large, but not being good few exchanged owners. This market, which has now been established about two years, is situated in one of the best and most respectable agricultural districts of the county, and has gained a pre-eminence which ranks it as one of the best in Cornwall.

SALISBURY FAIR.—The number of sheep penned was about a thousand more than last year. Trade was not brisk, but in some instances an increase of 1s. per head over the prices realized at Stockbridge was obtained. Ewes may be quoted from 28s. to 36s., wethers from 30s. to 45s., and lambs from 20s. to 30s. per head. There was a good supply of cattle and horses, in which some business was transacted at good prices.

SHERBORNE GREEN FAIR was but poorly supplied and attended, and for a long time business in the few sheep and cattle for sale was exceedingly dull. Three-year-old steers were sold for £10, and good two-year-old heifers in milk could not find a purchaser at £1 above that figure; but ultimately the trade in beef was called brisk, and a good many sheep changed hands at from 35s. to 40s. each.

STRATFORD-ON-AVON FAIR.—A good supply of stock and stores, but trade ruled flat, owing to the poor attendance of buyers. Of sheep there were 1,250 penned, and some excellent lambs, which were mostly sold at a reduction in price since our last fair. Beef and Mutton averaged from 6d. to 7d. per lb.

ANSWER TO AGRICULTURAL QUERY.

SIR,—The effect of salt in agriculture is, as your correspondent seems aware, two-fold; and of opposite tendencies.

First. Improving, if not increasing, the growth of plants.

Secondly. Destructive to animal and vegetable life.

For the first, foul salt is best—that is, foul with animal matter; and few plants will bear more than 4 cwt. per acre, applied while growing.

For the second, the destruction of grubs and insects, and of the seeds and roots of weeds, during fallow, the purer salt is the more effective; and the quantity applied must be much greater.

For both, but especially the second, the admixture of lime is generally advantageous. During the fallow, the caustic lime and salt kill the weeds, roots and seeds, as well as the grubs and insects, and many of their eggs (though perhaps not all), and get washed down by the rains out of the way of the next seeding, and following down the grubs, &c., which burrow to get out of their action.

The point is, to apply enough to destroy the injurious matters, without leaving the upper soil salt enough to injure the coming seed; and, with this view, from 15 to 20 cwt. of foul salt per acre, mixed with as much slaked lime, and ploughed in, might not be too much, if the land remains fallow the winter. But the experiments on salt culture are not yet so consistent and decisive as to inspire full confidence; nor do I recollect any more satisfactory practical account of them, pro and con., than that in the first volume of British Husbandry (Library of Useful Knowledge), pp. 377 to 390.

J. PRIDEAUX.

P.S. Another use of salt may be worth notice, this season, when many farmers are putting together large ricks of hay, hastily dried, so as to be in danger of over-heating. Salt sprinkled in, about 1lb. to the cwt., will prevent this, unless the hay is very imperfectly dried; in which case 2lbs. or 3lbs. of salt may be used. But too much salt may prevent the sweetening of the hay with age, which brings a better price, though perhaps not more nourishing.

DAIRY SHELVES.—For dairy shelves slate is much the best material. Fishmongers find that it preserves fish twenty-four hours longer than marble.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF JULY.

From the various heavy storms experienced at intervals throughout the month of July, some excitement has now and then been witnessed, and the fluctuations in grain have been more numerous than during the preceding month, but at no time of any great importance, the high prices inducing every description of buyers to act with the greatest caution, taking scarcely more than one week's consumption, even when prices pointed upwards. The imports of the month have been smaller of wheat, coming principally from the north of Europe; but the quality of the shipments from the Baltic has on the whole been inferior, arriving out of condition when the vessels had long passages, and much of the supply was taken to granary for improvement, many holders at the same time expecting better opportunities of realizing their stocks before the harvest could be secured. Of oats the imports have been very liberal, Denmark, Sweden, and Norway amply making up for the loss of the Russian supply. It seems the general opinion that these imports cannot be kept up much longer, and that the new crop will be begun on immediately it can be brought to market. The aspect of the war gives no hope of any increase in the imports of grain from those ports connected with Russia, which continue to be so strictly blockaded; but from the Danube shipments have been allowed to neutral countries, and much of these will doubtless ultimately find their way to the United Kingdom.

The supply of wheat at Mark Lane the first Monday of the month was limited from Essex and Kent, with very little offering from distant counties; prices in the various agricultural districts being about the same as those in London, and all wanted for local use or better markets. There was a fair steady demand, without any quotable change in the value of good samples, the highest price of fine red being 78s. per qr., and of choice white 84s. per qr., with about half the supply required by the town millers. The business transacted in foreign wheat was to a moderate extent, mostly from the finer qualities, which are scarce in this season's import, from so much having been secured in poor condition in Pomerania and throughout Prussia: the prices obtained were about the same as those of the previous week. The imports consisted of 910 qrs. from Alexandria, 110 from Bremen, 7,035 from Danzic, 580 from Griefswalde, 49 from Hambro', 1,630 from Konigsberg, 1,700 from Marseilles, 1,611 from Rostock, 370 from Samsoe, 600 from Stockholm, 1,260 from Stralsund, and 580 qrs. from Wolgast, making a total of 16,508 qrs., against 20,010 qrs. the corresponding week of last year. The London average registered 79s. 6d. on 3,153 qrs. The general return was 76s. 7d. on 68,925 qrs., against 77s. 11d. on 54,730 qrs. the corresponding week of last year. This is the smallest quantity returned since the 27th January last.

At Mark Lane the second Monday of the month the supply of wheat from Essex and Kent was short, and there was little offering by the merchants, who sell for delivery by the various railways. The best samples were taken off steadily at previous prices, but other sorts were in slow request, owing probably to the favourable state of the weather for the crops since the previous Monday. The top price of red was 78s. per qr., and that of white 84s. per qr. There was a moderate business transacted in foreign wheat, at fully as much money, the demand being mostly confined to the best conditioned parcels, and to such as our millers can make use of immediately. The imports were only moderate, consisting of 1,050 qrs. from Alexandria, 660 from Bremen, 934 from Constantinople, 2,282 from Danzic, 70 from the East Indies, 280 from Hambro', 900 from Konigsberg, 60 from Limpias, 900 from Nykiobing, 550 from Ottendorff, 525 from Riga, 770 from Seville, 6 from Skive, 824 from Stettin, 620 from Stockholm, and 547 qrs. from Stralsund, making a total of 11,540 qrs., against 37,663 qrs. the corresponding week of last year, exhibiting a much greater deficiency than the previous week. The London average registered 79s. 7d. on 2,602 qrs. The general return was 75s. 11d. on 84,791 qrs., against 77s. 8d. on 57,945 qrs. the corresponding week of last year. It will be seen that this return is 15,866 qrs. more than that of the preceding week, arising out of stringent orders from the general comptroller of corn returns to have all sales returned in the 290 towns included in the act of parliament for that purpose; and the previous comparison will consequently be lost, for it is a well-known fact that the deliveries from the farmers are steadily falling off, and, as we said in our last review, such will most probably be the case up to harvest.

The quantity of wheat brought forward at Mark Lane the third Monday of the month was shorter than any previous week for some time past, from

all the near counties, with very little from any other district; and as heavy storms had been experienced within a few days in many localities, and the morning proving a very wet one, the tone of the trade was improved, without, however, any excitement being witnessed. A steady demand took place, and all fine fresh-thrashed qualities commanded an advance of 1s. to 2s. per qr., choice red having touched 80s., and the best white 86s. per qr. Some of our large town millers have now a difficulty in obtaining as much fresh wheat as they require, and they cannot purchase foreign to the extent wanted, from its poor condition. Country buyers took off the best samples of Danzic and red Baltic wheats, at about 2s. per qr. enhancement in value, and many factors held for a still greater advance. The imports consisted of 50 qrs. from Aalborg, 475 from Corsoe, 638 from Danzic, 255 from Faulborg, 400 from Horsens, 475 from Kioge, 688 from Konigsberg, 350 from Norkoping, 1,860 from Requejada, 1,810 from Rostock, 790 from Stettin, 760 from Stralsund, and 81 qrs. from Tonning, making a total of 9,450 qrs., against 28,293 qrs. the corresponding week of last year. The London average registered 78s. 11d. on 3,417 qrs. The general return was 76s. 1d. on 88,195 qrs., against 76s. 6d. on 46,473 qrs. the corresponding week of last year, showing a manifest difference, and still proving how excellent the yield of 1854 must have been, and what a blessing to this country it has proved in every respect, putting our agriculturists into a nice healthy state once more in their lives! Abundance and high prices do not generally accompany each other at one and the same time, as has been the case this year.

The fresh supply of wheat from Essex and Kent, the fourth Monday, at Mark-lane, was short; but the weather having been very fine for a few days, had its accustomed influence on the minds of the buyers, and trade became very dull, losing all the improvement obtained on the Friday, and going back to the rates of the previous Monday, and even then some quantity was left over unsold for future markets. From more distant counties there was scarcely any supply of English wheat, prices in each locality being about the same as those of the metropolis. The demand for foreign wheat was very limited, and the quality generally being unsatisfactory, sales are the more difficult to effect in dull markets, and much of the supply continues to go to granary for improvement in condition, and in the hopes of better prices being obtained before the harvest has been secured. The imports consisted of 5,294 qrs. from Alexandria, 1,350 qrs. from Dantzic, 1,093 qrs. from Gothenburg, 899 qrs. from Hambro', 693 qrs. from Konigsberg, 1,420 qrs. from Leghorn, 1,340 qrs. from Messina, 300 qrs. from Oporto, 1,781 qrs. from Rostock, 400 qrs. from Santander, 1,840 qrs. from Seville, 1,022 qrs. from Stettin, 710 qrs. from Stolpemunde, 300 qrs. from Sudwesthorn, 2,980 qrs. from Trieste, 290 qrs. from Wismar, and 700 from Wolgast, making a total of 22,530 qrs., against 13,281 qrs. in the corresponding week of the past year. The London averages registered 80s. 8d., on 3,485 qrs. The general returns were 85,365 qrs., at 75s. 11d., against 41,808 qrs., at 74s. 6d., the corresponding week of last year. For two or three weeks more the deliveries will continue to be thus liberal, and perhaps larger, as usually before harvest an effort is made to bring a quantity to market.

There have been more changes in the article of flour during this than throughout the previous month, particularly in Norfolks, which have varied more and oftener than Consols, keeping up their character well; whilst the top price of town-made has remained stationary at 70s. per sack, households have varied from 60s. to 63s., country marks from 56s. to 60s. per sack, fresh manufactured qualities alone being wanted, as is mostly the case during hot weather. The arrivals the first week were 1,290 sacks coastwise, 48 sacks from Ireland, 9,729 sacks by the Eastern Counties Railway, and 2,236 sacks by the Great Northern. Norfolks were sold at 53s. to 54s. per sack. The arrivals the second week were 2,012 sacks coastwise, 48 sacks from Ireland, 7,535 sacks by the Eastern Counties, and 1,129 sacks by the Great Northern, with 10,345 sacks of foreign. Prime country marks were 1s. to 2s. per sack higher, and Norfolks brought 54s. to 56s. per sack. There was a good steady trade the third week of the month, and some descriptions of country marks were 1s. per sack dearer, Norfolks bringing 55s. to 56s. per sack; the arrivals coastwise were 1,087 sacks, by the Eastern Counties Railway 7,027 sacks, and by the Great Northern 1,311 sacks, with 2,592 sacks and 155 barrels foreign. Spanish samples commanded 59s. to 60s. per sack, being generally of a very superior quality, and a great favourite in pastry. The fourth week trade was checked by the dull state of the wheat market, and had business been pressed, lower prices must have been accepted, although fresh-made samples continued to be wanted, and the stocks are weekly reduced from all the country makers. Norfolks were offered at 55s. per sack, without bringing buyers forward freely; Spanish, 59s. to 60s.; town households, 62s. to 63s.; and the top price of town-made remained at 70s. per sack. The arrivals coastwise were 1,826 sacks, by the Eastern Counties Railway 9,800 sacks, by the Great Northern 1,939 sacks.

There has been a steady and improving demand for the article of barley throughout the month,

and prices have gradually been enhanced, although not to any great extent. The deliveries in all the agricultural districts have been to a trifling extent, and not much is now supposed to be left in the hands of the farmers, and by the time new can be brought forward, the stocks are likely to be exhausted; but the imports of foreign have been on the increase, coming principally from Denmark, and generally of fine heavy quality, which has continued to meet a pretty ready sale to the distillers, who have gradually increased their stocks of fresh parcels to hold over until the 1st of October, when the new act for making malt in bond will come into operation. There has been an increased consumption of the latter article during this month, and we shall not be surprised to find that all which has been made will be consumed this season, and that no stocks of old malt worthy of notice will be left when the time for making arrives. The first week's imports were 2,387 qrs., the second 3,315 qrs., the third 7,564 qrs., the fourth 5,961 qrs., scarcely any of which came from the South of Europe, as there it is wanted too much for the Crimea, and will be, so long as the present disastrous war continues. The averages since our last review have been 34s. 3d. on 6,432 qrs., 34s. 3d. on 8,003 qrs., 34s. 5d. on 5,331 qrs., and 34s. 7d. on 6,204 qrs.; and from this point the deliveries are likely to fall off steadily until all the stocks have been cleared out of the hands of the farmers, and when the new crop begins to come to market, if a fair quality be secured, the demand is likely to set in with a degree of briskness.

The arrivals of oats from our own coast and Scotland have been of the most trivial character, and such is likely to be the case until new corn can be brought to market; whilst from Ireland we may get fair quantities, the consumption of Indian corn there enabling the merchants to ship off their oats freely. The arrivals coastwise the first week were 30 qrs., by the Eastern Counties Railway 105 qrs., by the Great Northern 35 qrs., from Scotland 440 qrs., from Ireland 1,940 qrs., from foreign ports 30,546 qrs. Good heavy and fresh qualities realized full prices, with a fair steady sale; but those cargoes wanting condition were difficult to place. During the second week the arrivals coastwise were 82 qrs., by the Eastern Counties Railway 304 qrs., by the Great Northern 60 qrs., from Scotland 10 qrs., from Ireland 625 qrs., and from foreign ports 32,225 qrs. Prime heavy corn brought about 1s. per qr. advance, and secondary sorts were quite as dear. The arrivals coastwise the third week were 70 qrs., by the Eastern Counties Railway 137 qrs., by the Great Northern 99 qrs., from foreign ports 49,987 qrs. Prime corn supported prices; but heated parcels were rather cheaper, and in limited request. The fourth week the arrivals coastwise were only 37 qrs., with none from Scotland, but 6,676 qrs. from Ireland, and from foreign ports 25,514 qrs. Choice heavy qualities continue to meet a good demand, and prices were well supported. Many of the imports have arrived out-of-condition, and these have been very difficult to sell, and in order to make progress it was necessary to give way 6d. to 1s. per qr., and a considerable portion remained unsold; and these will have to go to granary for improvement, or be sold at a great loss to the importers.

The demand for beans has been well kept up, and prices have been tolerably steady, prime qualities of English continuing in moderate demand, with a falling off in the deliveries in all the agricultural counties, and the stocks are considered to be much reduced in the hands of the farmers, whilst the merchants hold very few. There have been very limited imports of this article from the North of Europe, but an increased quantity from Alexandria, and the value of the latter description has fluctuated occasionally 1s. to 2s. per qr. within the month, rallying a little since the crop of hay has been found so short generally; the present value is 30s. to 37s. per qr. at this and most ports on the West Coast, and there does not seem much prospect of any immediate change, owing to the low stocks of English held throughout the United Kingdom, and they are considered exhausted in the North of Europe, but are large now in Egypt, and from thence they will find their way to this country pretty extensively; the more liberally if present prices are maintained, and freights remain moderate, which most probably will be the case from the falling off of other imports and want of full employment for shipping generally. The weekly averages have been—47s. 1d. on 4089 qrs., 46s. 6d. on 2970 qrs., 46s. 4d. on 2988 qrs., 45s. 11d. on 2590 qrs., and 46s. on 2738 qrs. There has been a very limited business transacted in peas, the deliveries continuing to be of the most trivial character, and will remain so until new samples can be brought to market. Prices of English have remained tolerably steady, but the consumption has been of the most trivial character, and will probably not be improved for a few months longer. Several small cargoes of foreign have come in from the North of Europe, which have met a dull sale, and at prices not likely to pay the importers. From Canada we have not received our usual supplies; all articles being so dear in that country, there was no encouragement to make shipments this season, and Glasgow has consequently gone short of this their usual resource for the article, when spring shipments are made. There are few stocks held anywhere, and the new crop will find a clear course

so soon as it can be brought forward, and prices probably will open high; the more so if the sample prove fine: of course the currency will afterwards depend on the yield and quality grown. The weekly averages have been—43s. 1d. on 372 qrs., 43s. 8d. on 294 qrs., 40s. 9d. on 268 qrs., 42s. 4d. on 239 qrs., and 42s. 10d. on 275 qrs.

The imports of foreign grain for the month ended the 30th June, as published in the *London Gazette* of the 13th July, were 692,836 qrs. grain, and 229,370 cwts. flour; against 702,138 qrs. grain, and 222,479 cwts. of flour, the corresponding month of last year; and the different articles stand thus:—

	1854.	1835.
	QRS.	QRS.
Wheat	357,104	383,076
Barley	43,704	49,313
Oats	126,008	125,861
Rye	370	3
Peas	5,440	6,878
Beans	21,895	54,136
Maize	147,071	73,011
Buckwheat	67	182
Bere	479	376
Total	702,138	692,836
Flour	222,479 cwt.	229,370 cwt.

This shows a very slight difference of imports in these two periods, arising from this years's arrivals embracing the large shipments from the Baltic; but from this time there will be a falling off in the quantity of wheat received, probably up to the time after harvest has been secured throughout Europe and America.

In the Baltic shipments of wheat have been made to a moderate extent, the previously exhausted stocks having received some replenishment by arrivals at several ports from the interior, and prices have been kept up very high, moving with every change in the British markets almost simultaneously, receiving the state of trade the same day from all important towns. At Danzig really choice qualities of wheat are worth 82s. to 83s. per qr. free on board, weighing 62 to 63 lbs. per bushel; good mixed samples 60 to 61 lbs., commanding 67s. to 72s. per qr. The stocks in granary at Rostock have been reduced to about 10,000 qrs., a mere bagatelle for that important shipping port to hold, and the choicest descriptions of red were worth 75s. to 76s. per qr., weighing 62 lbs. per bushel. At Hamburg there has been a somewhat extensive business transacted at times throughout the month in most articles of grain. 59 to 59½ lbs. Marks wheat was worth 71s. to 72s. per qr.; 59 to 61 lbs. Mecklenburg 70s. 6d. to 73s. per qr.; 57 to 57½ lbs. Wahren from 67s. to 68s. per qr., weighed 60 lbs. per bushel. The sales at the outports have been numerous: 61 to 61½ lbs. Stralsund wheat has brought 77s. per qr. free on board, and including freight to London. 60 to 61 lbs. Danish may be considered worth 69s. to 70s. per qr.; 60 to 60½ lbs. Pomeranian ranges from 68s. to 72s. per qr. as in condition. Holstein barley has commanded 33s. per qr. weighed 448 lbs., being a very superior description. Kilndried barley from the outports has brought up to 31s. per qr. free on board, and lower sorts in proportion. Oats on the east coast of Jutland have been sold at 24s 3d. to 24s. 9d. per qr. weighing 39½ to 40 lbs.; 38 to 39 lbs. Swedish oats have brought 24s. per qr.; black and white from the west coast of Holstein 23s. 6d. to 24s. per qr.; beans have reached 40s. per qr. 63 lbs. per bushel. The stocks of this article are very low at Hamburg and the outports. The cutting of rapeseed had commenced in some of the lower Elbe districts, but the probable extent of the crop is not yet noticed.

In the Belgian markets wheat has realized high prices, although latterly, from the abundance offering, somewhat lower rates have been submitted to. At Louvain choice 62 to 64 lbs. must be considered worth 80s. to 82s. per qr.; secondary sorts 60 to 62 lbs. 77s. to 79s. per qr.; rye weighing 56 lbs. 48s. to 50s. per qr.; winter barley, 50 lbs. per bushel, 40s. to 42s. per qr. In Holland prices of wheat have slightly given way, but are still too high for shipments to be made to advantage to England, and there is now very little passing in this article between the two countries.

In the early part of the month the French markets were more lively, and prices well supported for both wheat and flour; but, although that country has been visited with numerous storms, trade has become languid, and the bakers have purchased flour in the most limited quantities possible, the millers giving way reluctantly; but on the whole a decline of four francs per sack has been established, the price of 90 francs being that now current for the four best marks of Paris, whilst for distant delivery only 80 francs had been offered; the stocks were reduced to 18,455 quintals. Some progress has been made in the cutting of rye and rapeseed in that country, and in the southern departments also in that of wheat, and so far the accounts agree in stating that a fair average crop may be expected, One sack of flour was sold at Paris on the 23rd instant made entirely from new wheat, and new rapeseed had appeared 14 days previously. There is no prospect of the export of grain being allowed to take place in that country, but flour made from foreign wheat could be sent away, and a few cargoes have appeared in the river Thames for Marseilles, thus manufactured in bond.

In the United States, harvest is now progressing,

and pretty favourably. On the 28th June, a sample of new wheat was sold at Philadelphia from Carolina, quality stated to be good; but as yet no supplies have come forward. At Buffalo the receipts of wheat from the 23d June, the opening of the canal navigation, had only amounted to about 150,000 qrs., generally consisting of inferior Upper Lake qualities. At New York the state of the weather, and the prospect of early arrivals of new wheat from the southern states, induced great caution amongst all classes of buyers: at the present high prices, there were of course no purchasers for export: good white Canada had been sold at 84s., white Michigan at 88s., and a small parcel of new southern at 83s. per 480 lbs. free on board, being higher than the prices in London for such qualities. From the north western states, the main source of supply, no quantity of new wheat can be expected prior to October. At 65s. to 70s. per 480 lbs. it is generally supposed that the millers will purchase, when the supplies of new begin to be brought forward freely; whilst shippers in all probability will wait for a range of 60s. to 65s. per 480 lbs., unless the English advices after harvest warrant a higher rate being paid. The finest brands of flour were selling at 41s. to 42s. per barrel. There was a decided falling off in the receipts from Buffalo, Oswego, and Rochester. Considerable shipments were expected to be made at New Orleans, where superfine St. Louis flour was quoted at 34s. 6d. per barrel.

Arrived now at one of the most important periods of the year, not only to the agriculturists, but to the nation at large, the weather will be watched with the greatest anxiety and intensity of feeling, under the existing circumstances in which this country is placed as regards the question of food for another year; and the sudden changes during the month of July cause some alarm in the minds of many, lest after so great a drought as was experienced up to the middle of the month, and for a long time previously, a wet season should set in, which would prove a great national disaster, and lead to consequences the most alarming; but let us hope we shall yet be blessed with fine weather for the ingathering of the fruits of the earth, and that a higher Power will watch over us, and be better to us than our fears, enabling the husbandman to secure plenty for man and beast, and that in due time the appointed weeks of harvest will be vouchsafed to his hand. Our advices respecting the crops are of a varied character, and the reports which come out this month will be read with deep interest from all parts of the United Kingdom. The heavy storms laid prostrate much of the wheat and the luxurious barley about the middle of the month, but the rains which fell during the week ended the 21st July, being accompanied by hot sunny weather and brisk breezes at intervals, improved and forwarded the wheat plant considerably, filling the ears, and the thin crops were much benefited, the backward shoots being enabled to make a better show of ears than was at one time expected. The barleys were, however, too much lodged; and it must be fine weather indeed to cause these to rise again. There will consequently be much coarse quality, and in this respect the change is much for the worse. The next week, however, the weather was of a different character. Monday appeared in some districts a close, thick, blighting day; and on the evening of that day rain set in, and in some localities continued twelve hours without intermission. The weather remained unsettled, Thursday proving a very wet day. The real effects of this week's weather will be known a few days after this publication has been circulated.

Previously to this there were hopes of early patches of wheat soon being ready for the sickle. Talavera might probably be cut by the 13th of August, but now we fear it may be the 20th; and with favourable weather from that point the early counties may partially be at work, but the general harvest may not be until the first week in September, and this probably only south of the Humber: northward will of course be later; and we now apprehend to have accounts of mildew on all the heavy wheats, which are lodged and beaten down so much as not to give hopes of rising again until they are cut and put into the sheaf.

Putting all our advices together, the present promise is for barely an average crop of wheat, a full or large yield of barley, moderate of oats, good of beans as far as spring planting, and fair of peas: the last two articles have been thoroughly cleaned by the numerous showers during the month. The crop of hay will prove a very light one in all parts of the United Kingdom; and some quantity has been caught by the rain since the 15th of the month.

As regards turnips, the early sown, after having been much injured by the fly, are now growing very fast; but the late ones do not progress so well, having had too much rain. The early sown are, however, unfortunately attacked by great quantities of caterpillars—not the small one which came four years ago, but the large garden caterpillar—and these are now threatening to do much injury.

QUANTITY OF FOREIGN GRAIN ENTERED FOR HOME CONSUMPTION DURING THE WEEK ENDING JULY 19, 1855.

Wheat.....	qrs. 15,201	Beans.....	qrs. 2,093
Barley.....	„ 9,903	Peas	„ 620
Oats	„ 39,399	Flour.....	cwts. 13,426

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter					
WHEAT, Essex and Kent, white	76	to	78	extra	80	84
Ditto, red.....	70		73	„	76	77
Norfolk, Lincoln. and Yorksh., red	71		73	„	75	76
BARLEY, malting, new..	32	33	....	Chevalier..	34	36
Distilling....	31	34	.....	Grinding ..	31	33
MALT, Essex, Norfolk, and Suffolk, new	65		66	extra		70
Ditto ditto old	66		68	„		70
Kingston, Ware, and town made, new	70		71	„		72
Ditto ditto old	68		70	„		71
RYE	—		—		40	43
OATS, English feed..	25	26	.....	Potato..	26	29
Scotch feed, new	28	29,	old 32 33 ..	Potato	32	33
Irish feed, white	25		26	fine		28
Ditto, black	24		26	„		27
BEANS, Mazagan.....	38		40	„	40	41
Ticks.....	39		43	„	42	43
Harrow.....	39		42	„	42	44
Pigeon	42		47	„	47	48
PEAS, white boilers	42	47..	Maple	40 42	Grey	37 40
FLOUR, town made, per sack of 280 lbs.	—		—		65	70
Households, Town 64s. 65s.	Country		—		58	60
Norfolk and Suffolk, ex-ship	—		—		53	55

FOREIGN GRAIN.

	Shillings per Quarter					
WHEAT, Dantzic, mixed..	84	to 85	high mixed	—	87	extra 92
Konigsberg	78	80	„	—	85	„ 86
Rostock, new	78	80	fine		85	„ 89
American, white	80	85	red		75	77
Pomera., Meckbg., and Uckermk., red	78	79	extra	78		81
Silesian.....	„	75	77	white	79	81
Danish and Holstein	„	68	74	„	74	78
Rhine and Belgium	„	—	—	old	—	—
Odessa, St. Petersburg and Riga..	70	71	fine	73		75
BARLEY, grinding	29	33	Distilling..		32	34
OATS, Dutch, brew, and Polands 28s. to 30s.			Feed ..		26	28
Danish & Swedish feed 26s. to 28s.			Stralsund		27	29
Russian.....	27	30	French..		none	
BEANS, Friesland and Holstein.....					42	43
Konigsberg ..	39	43	Egyptian ..		37	38
PEAS, feeding	39	40	fine boilers		43	45
INDIAN CORN, white	47	48	yellow		47	50
FLOUR, French, per sack.....	—	—	Spanish		60	61
American, sour, per barrel	38	40	sweet		40	45

IMPERIAL AVERAGES.

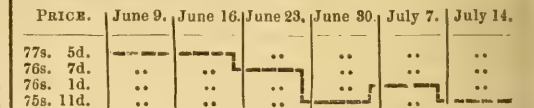
FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
June 9, 1855..	77	5	33	11	28	10	47	4	46	1	42	1
June 16, 1855..	77	5	34	1	28	7	45	10	46	6	43	6
June 23, 1855..	76	7	34	3	29	3	45	9	47	1	43	1
June 30, 1855..	75	11	34	3	28	8	45	6	46	6	43	8
July 7, 1855..	76	1	34	5	28	6	44	6	46	4	40	9
July 14, 1855..	75	11	34	7	28	8	44	8	45	11	42	4
Aggregate average of last six weeks	76	6	34	3	28	9	45	7	46	5	42	7
Comparative avge. same time last year	77	3	37	0	30	2	49	7	49	5	47	2
DUTIES.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Av. s.	d.	Averages from the corresponding *Gazette* in 1854.	Qrs.	Av. s.	d.
Wheat....	85,365 ..	75	11	Wheat....	41,808 ..	74	6
Barley....	6,204 ..	34	7	Barley....	2,615 ..	36	10
Oats	9,193 ..	28	8	Oats	6,447 ..	29	8
Rye.....	117 ..	44	8	Rye.....	27 ..	51	1
Beans....	2,590 ..	45	11	Beans....	1,680 ..	48	10
Peas	239 ..	42	4	Peas	191 ..	45	9

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING JULY 14, 1855.



PRICES OF SEEDS.

BRITISH SEEDS.

Coriander (per cwt.)	20s. to 24s.
Carraway (per cwt.).... new 44s. to 46s., old	00s. to 00s.
Canary (per qr.).....	46s. to 50s.
Hempseed (none)	00s. to 00s.
Linseed (p. qr.) sowing .. s. to .. s., crushing	70s. to 73s.
Linseed Cakes (per ton)	£12 0s. to £12 10s.
Rapeseed (per qr.)	new 84s. to 86s.
Ditto Cake (per ton)	£6 10s. to £6 15s.

FOREIGN SEEDS, &c.

Hempseed, small, (per qr.) 48s. 50s., Ditto Dutch,	54s.
Coriander (per cwt.)	15s. to 20s.
Carraway	36s. to 38s.
Linseed (per qr.) Baltic, 70s. to 72s.; Odessa, 72s. to 75s.	
Linseed Cake (per ton)	£11 10s. to £12 10s.
Rapeseed, Dutch	80s. to 84s.
Rape Cake (per ton).....	£6 10s. to £6 15s.

HOP MARKET.

BOROUGH, MONDAY, July 23.

The continuance of favourable accounts from the hop districts causes the few hops remaining on offer in our market to move off very slowly, and to effect sales to any extent reduced prices are submitted to.

Duty £250,900.

MAIDSTONE, JULY 19.—The hops have grown very fast during the past week, and they are generally speaking very healthy and free from vermin; at places, however, there are slight appearances of mould, and should the weather continue to be wet mould is likely to increase. At present, appearances bid fair for a heavy crop, but we do not think it will be so large as many people are led to expect. We hear it said that the show of bine this year denotes a larger growth of hops than has been known for many years, but still it should be borne in mind that in some parishes the bine at places is extremely weak, and not at all likely to grow anything like a great quantity of hop. Duty is still called from £240,000 to £250,000. Our local reports state there is every prospect of a good crop.—*Sussex Express.*

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

MONDAY, July 23.

The arrivals of foreign Potatoes last week amounted to 18,977 baskets, wholly from Rotterdam; and the receipts of English have been on the increase. On the whole the demand is steady, and prices are well supported. English are selling at from 7s. to 8s. per cwt., and foreign 4s. per cwt.

COUNTRY POTATO MARKETS.—YORK, July 14.—Old potatoes are now finished for the present season. New ones are plentiful, and of good quality, and sell at 5d. per quartern. LEEDS, July 17.—A fair supply of new potatoes; wholesale 20d. to 22d. per 22lbs., and retail 2lbs. for 2½d. MALTON, July 14.—A moderate supply of old potatoes sold at 12d.; new ditto, 6d. to 7d. RICHMOND, July 14.—Old potatoes, 3s. 4d.; new ditto, 8s. per bushel. SHEFFIELD, July 17.—A fair show of new potatoes sold at from 7s. to 8s. per 106lbs. MANCHESTER, July 17.—New potatoes are selling at from 14s. to 17s. per 252lbs.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	*Cheese, per cwt.*	s.	s.
Friesland	100 *to*	104	*Cheshire*	70 *to*	84
Kiel	96	100	*Chedder*	70	84
Dorset, new	100	106	*Double Gloucester*	68	74
Carlow	94	98	*Single do.*	56	70
Waterford	90	94	*Hams, York*	80	90
Cork, new	84	98	*Westmoreland* ,,	76	86
Limerick	..	..	*Irish* ,,	74	84
Sligo	..	..	*Bacon, Wilts., dried*	78	80
Fresh, per doz.	11s. 0d.	13s. 0d.	*Irish, green*	72	74

ENGLISH BUTTER MARKET.

LONDON, July 23.

We note a good trade in Butter, and at an improvement in price of 2s. per cwt. on best quality.

Dorset fine	104*s. to* 106*s.*	*per cwt.*
Do. middling	92*s. to* 96*s.*	,,
Devon	98*s. to* 100*s.*	,,
Fresh	11*s. to* 13*s.*	*per dozen.*

BISHOPSTOKE MONTHLY CHEESE MARKET, (Thursday last.)—There was not quite so much as usual at this market, which may be attributed to the weather; the attendance of buyers was large; consequently a good clearance was soon effected, not more than a fourth remaining unsold. Prices: Skims, 32s. to 36s.; half ditto, 52s. to 58s.; Wiltshire doubles, 60s. to 65s.; Somersets, new, 66s. to 70s.; old ditto, 72s. to 78s.; Cheddar, 78s. to 84s.

GLASGOW, (Wednesday last.)—A good supply of Cheese (12 carts), which met with a dull sale at last Wednesday's rates. Old was scarce and dear. There passed through the weigh-house, adjoining the Bazaar, 2 tons. Old Cheese, 56s to 65s.; new, 43s. to 47s.; skim milk Cheese, 25s. to 27s. per cwt.

COVENT GARDEN MARKET.

SATURDAY, JULY 21.

Both Vegetables and Fruit are well supplied; and foreign produce continues to be largely imported. West India Pines are still arriving in great quantities, and English ones are now unusually well supplied. Peaches, Nectarines, and Cherries are plentiful, more especially Cherries, which are in consequence cheap; and Grapes of excellent quality are abundant. French Cherries fetch from 2d. to 6d. per pound. Oranges realize from 8s. to 16s. per hundred. New Potatoes are fetching 7s. to 15s. per cwt. Lettuces realize from 6d. to 9d. per score. Cut flowers consist of Passion-flowers, Heliotropes, Euphorbias, Pinks, Carnations, Cyclamens, Azaleas, Chinese Primroses, Heaths, and Roses.

FRUIT.

	s.	d.	s.	d.		s.	d.	s.	d.
Pineapples, p. lb.	3	0 @	6	0	*Melons, each*	2	0	5	0
Grapes, per lb.	3	0	6	0	*Cherries, per lb.*	0	4 @	2	0
Peaches, per doz.	8	0	20	0	*Strawber., p. oz.*	0	2	0	6
Nectarines, do.	6	0	15	0					

VEGETABLES.

	s.	d.	s.	d.		s.	d.	s.	d.
Cauliflowers p dz.	2	0	4	0	*Spinach, p. sieve.*	1	0	2	0
Cab., red, p. doz.	2	0	6	0	*Beet, per doz.*	1	6	2	0
Fr. Beans, p. 100	0	6	1	0	*Celery, per bund.*	1	0	1	6
Rhubarb p. bund.	0	3	0	6	*Leeks, per bunch*	0	2	0	3
Asparagus, p. 100	2	0	5	0	*Shallots, per lb.*	0	4	0	6
Peas, p. hf. sieve	1	6	2	6	*Garlic, per lb.*	0	6	0	8
Potatoes, per ton	80	0	180	0	*Lettuce, Cab., p. s.*	0	9	1	0
Do., per cwt.	2	6	5	0	*Do., Cos., p. sc.*	1	0	1	6
Do., perbush.	1	6	3	0	*SmallSal. p. pun.*	0	2	0	3
New, per cwt.	10	0	0	20	*Horserad., p. bnd.*	2	0	4	0
Carrots, p. bun.	0	4	0	6	*Mushr'ms, p. pot.*	1	0	1	6
Turnips, p. bun.	0	4	0	6	*Parsley, p. bunch*	0	3	0	4
Cucumbers, each	0	3	1	0	*Marjoram, perbh.*	0	4	0	6
Radishes, Turnip					*Sweetherbs, p. bh.*	0	2	0	4
per 12 bunches.	1	0	2	0	*Mint, gr., p. bun.*	0	2	0	4

CHICORY.

LONDON, SATURDAY, JULY 21.

The imports of Chicory since our last have been 95,000 lbs. from Norden, and 179 bales from Harlingen. For both English and foreign qualities we have a slow sale, at about stationary prices.

Per ton.

	£	s.	£	s.		£	s.	£	s.
Foreign Root (in bond) Harlingen	11	0	11	10	*Roasted & ground*				
English Root (free)					*English*	14	0	20	10
Guernsey	9	0	9	10	*Foreign*	30	0	36	10
York	9	10	10	0	*Guernsey*	26	0	28	0

HIDE AND SKIN MARKETS.

SATURDAY, JULY 21.

	s.	d.	s.	d.	
Market Hides, 56 to 64 lbs.	0	$3\frac{1}{4}$	0	$3\frac{1}{2}$	*per lb.*
Do. 64 72 *lbs.*	0	$3\frac{1}{2}$	0	$3\frac{3}{4}$	,,
Do. 72 80 *lbs.*	0	$3\frac{3}{4}$	0	4	,,
Do. 80 88 *lbs.*	0	4	0	$4\frac{1}{4}$	,,
Do. 88 96 *lbs.*	0	$4\frac{1}{4}$	0	$4\frac{1}{2}$	,,
Horse Hides	5	6	0	0	*each.*
Calf Skins, light	2	0	3	0	,,
Do. full	6	0	6	6	,,
Lambs	2	3	3	4	,,
Shearlings	1	6	1	10	,,

BARK, &c.

	£	s.	d.	£	s.	d.
English, per ld. of 45 cwt., del. in London.	13	10	0	15	10	0
Coppice	14	0	0	16	0	0
Dutch, per ton	5	0	0	5	10	0
Hambro'	4	10	0	5	10	0
Antwerp—Tree	5	10	0	6	5	0
,, *Coppice*	6	0	0	6	15	0
French	4	0	0	6	10	0
Mimosa	13	0	0	15	0	0
,, *Ground*	0	0	0	0	0	0
Cork Tree—Barbary	7	0	0	7	10	0
,, *Leghorn*	6	0	0	7	0	0
Valonia, Smyrna, per ton	13	0	0	16	0	0
,, *Camata*	15	0	0	16	0	0
,, *Morea*	10	10	0	13	0	0
Terra Japonnica } *Gambier*	17	10	0	18	10	0
Terra Japonnica } *Cutch*	22	0	0	23	0	0
Divi Divi	14	0	0	14	10	0
Myrabolams	7	10	0	11	0	0
Sumach Sicily, per cwt.	0	14	6	0	16	6

METALS.

LONDON, SATURDAY, JULY 21.

The market for Spelter has been inactive, at £22 17s. 6d. to £23 2s. 6d. per ton. Tin is brisk. Banca is worth 119s., straits 116s. to 117s., refined 122s. Tin plates continue active, IC coke 27s., IC charcoal 33s. 6d. per box. Lead and Copper command full prices. The Iron market is dull, and sales of Scotch pig have been made as low as 71s. 6d.

ENGLISH IRON.	*Per ton.* £	s.	d.
Bar and bolt a £8 15—	9	10	0
In Wales a .. £7 10—	8	0	0
In Liver. a	9	5	6
In Staffordshire a.	11	10	0
**Sheets, single a* £10 10—	10	15	
* ,, *double a* .. £11 11—	12		
**Hoop a* .. £10 10—	11	0	
**Nail rod, rnd. a* £10 5-	10	15	
,, *square a*	9	15	0
Rails (Wales) c .. £6—	6	10	0
(Staffordsh.) c £10 10—	11	0	
Railw. Chairs, Clyde	5	19	0
Pig, No. 1, Clyde c	3	14	0
3-5ths No. 1 & 2-5ths No. 3	3	11	6
No. 1, in Wales b	4	10	0
Scotch pig No. 1 in London	3	8	0
Stirling's Non-laminating or Hardened Surface Rails .. £9—	9	2	0
C.-blast, No. 1 Foun.	6	10	0
Charcoal bars	14	10	0
Stirling's Patent toughened Pigs, in Glasgow	3	12	6
Do. in Wales .. £4—	4	5	0
FOREIGN IRON. *a.*			
Swedish .... £15 0—	15	10	0
Russian CCND	17	0	0
Ind. Ch. Pigs in Lon.	6	0	0
FOREIGN STEEL. *a.*			
Swedish keg, nom. £18 10—	19		

SPELTER. *c.*	*Per ton.* £	s.	d.
On the spot £22 17 6-	23	2	6
To arrive	23	5	0
ZINC.			
In sheets d .. £28 0—	28	10	0
ENGLISH COPPER.			
Tile, 14 to 28lbs. a	126	0	0
Tough cake a	126	0	0
Sheath. & bolts a. p. lb	0	1	2
Sheet a	0	1	2
Bottoms a	0	1	3
Yellow Metal a	0	1	0
Wetterstedt's Patent Metal† cwt.	2	0	0
ENGLISH LEAD. *a.*			
Pig, per ton £22 10—	23	0	0
Sheet .... £23 10—	24	0	0
FOREIGN LEAD. *a.*			
Span. in bond p. ton £21-	21	10	
ENGLISH TIN. *e.*			
Block per cwt. £5		18	0
Bar	5	18	0
Refined	6	2	0
FOREIGN TIN. *c.*			
Banca	5	19	0
Straits (uncertain)	5	16	0
TIN PLATES. *b.*			
IC Charcoal, p. box	1	13	6
IX ditto	1	18	0
IC Coke	1	7	0
IX ditto	1	13	0
Canada plates per ton	15	0	0
Quicksilver, f, p. lb	1s. 10d.	1s 11d	

Terms.—a, $2\frac{1}{2}$ *per cent. dis.; b,* 3 *ditto; c, nett; d,* $1\frac{1}{2}$ *per cent. dis.; e.* 2 *ditto; f,* $1\frac{1}{4}$ *ditto.*

Delivered in Liverpool, 10s. per ton less.

* *Cold blast, f.o.b. in Wales.*

† *Dis. for cash in 14 days per 5 cent.*

OILS.

	£	s.	d.		£	s.	d.
Olive, Florence half-chests	1	3	0	*to*	0	0	0
Lucca	7	10	0		8	0	0
Gallipoli (252 gallons)	55	0	0		57	0	0
Spanish	51	0	0		53	0	0
Linseed (cwt.)	2	4	0		0	0	0
Rape, Pale	2	15	0		2	16	0
Brown	2	3	6		2	4	0
Cod (tun)	46	10	0		47	0	0
Seal, Pale	52	0	0		53	0	0
Ditto, Brown, Yellow, &c.	45	0	0		50	0	0
Sperm	126	0	0		128	0	0
Head Matter	102	0	0		104	0	0
Southern	45	0	0		48	0	0
Cocoa Nut (cwt.)	2	0	6		2	1	6
Palm	2	0	0		2	1	6
WHALEBONE.							
Greenland, full size (per ton)	240	0	0		245	0	0
South Sea	185	0	0		190	0	0
PITCH.							
British (per cwt.)	0	8	0		0	0	0
Archangel	0	10	0		0	0	0
Stockholm	0	12	0		0	0	0
TURPENTINE.							
Spirits (per cwt.)	1	12	0		1	12	6
In Puncheons	1	11	0		0	0	0
Rough	0	8	0		0	0	0
TAR.							
American (British)	1	1	0		1	3	0
Archangel	1	17	0		1	19	0
Stockholm	1	7	0		0	0	0
RESIN.							
Yellow (per cwt.)	0	7	0		0	0	0
Transparent	0	6	0		0	0	0

WOOL MARKET.

ENGLISH WOOL MARKET.

LONDON, JULY 23.—During the past week there has been only a moderate business doing in our market, arising from the manufacturers being better in stock, and to the somewhat large parcels brought forward of the present year's clip. There is, however, no inclination on the part of holders to accept lower prices, and we may consider the trade as healthy; very few foreign orders are in the market.

	s.	d.		s.	d.
Down tegs	1	0	to	1	1½
Do. ewes	0	11	—	1	0½
Half-bred hoggets	0	11	—	1	1
Do. wethers	0	11	—	1	0
Kent fleeces, mixed	1	0½	—	1	1
Leicester fleeces	0	11½	—	1	0
Combing Skins	0	10½	—	1	1
Flannel Wool	1	0	—	1	2
Blanket Wool	0	8	—	1	0

BRECHIN WOOL FAIR was largely attended by wool growers and staplers. The show was about an average, both as to quantity and quality. Sales were mostly effected in the course of the afternoon, at a rise of from 3s. to 5s. per stone above last year's rates. The inactive state of the market in the early part of the day was occasioned solely by the unwillingness of buyers to submit to the increased prices which were ultimately obtained by the sellers.

DONCASTER WOOL MARKET, (Saturday last.)—Less wool was shown to-day, and fewer buyers in attendance. The trade was flat, and little business done in the early part of the day, as sellers would not take prices offered. Towards the close, most of the lots were sold at a reduction of 3d. to 6d. per stone.

LIVERPOOL WOOL MARKET, JULY 21.

SCOTCH WOOL.—There has been nothing doing in Scotch this week, as all are waiting the result of the Scotch fairs: the principal ones take place this week. From all report prices are from 10s. to 15s. above last year at the same period; but there is no alteration in this market yet.

	s.	d.		s.	d.
Laid Highland Wool, per 24lbs.	8	9	*to*	9	6
White Highland do.	12	6		13	6
Laid Crossed do..unwashed	11	0		12	0
Do. do..washed	12	0		13	6
Laid Cheviot do..unwashed	13	6		15	0
Do. do..washed	16	6		18	6
White Cheviot do..do	24	0		25	0

FOREIGN WOOL.—There is a good inquiry for all kinds of low, middle, and fine clothing wool; for combing classes, although the demand and prices have improved, still not so much as on the clothing sorts. A small sale of damaged East India, 400 bales, took place on the 19th: the attendance was good, and full prices obtained. Stocks of all kinds are now exceedingly light; with a better supply a large business might be done.

AGRICULTURAL MEETINGS AND GATHERINGS FOR 1855.

AUGUST 1 and 2.—Yorkshire Agricultural Society. Meeting at Malton. Entries close July 18. Secretary, Mr. J. Hannam, Kirk Deighton, Wetherby.

AUGUST 8.—Wetherby Agricultural Society. Meeting at Wetherby. Entries closed July 26. Secretary, Mr. James Coates.

AUGUST 8, 9, and 10.—Royal Agricultural Improvement Society of Ireland. Meeting at Carlow. Entries close July 18. Secretary, Mr. T. Harkness, Upper Sackville-street, Dublin.

AUGUST 16.—Cleveland Agricultural Society. Meeting at Guisbro'. Entries close August 4. Secretary, Mr. Thomas Parrington.

AUGUST 23.—North Lincolnshire Agricultural Society. Meeting at Boston.

AUGUST 23 and 24.—North East Agricultural Association of Ireland. Meeting at Belfast. Entries close July 20. Secretary, Mr. Borthwick, King-street, Belfast.

SEPTEMBER 6.—Manchester and Liverpool Agricultural Society. Meeting at St. Helen's. Entries close August 28. Secretary, Mr. T. B. Ryder, 2, Elliot-street, Clayton-square, Liverpool.

SEPTEMBER 20 and 21.—Sparkenhoe Farmers' Club. Meeting and Stock Show at Atherstone. Entries close August 14. Secretary, Mr. J. H. Pilgrim, Atherstone.

SEPTEMBER 21.—Bury and Radcliffe Agricultural Society. Meeting at Bury. Entries close September 10. Secretary, Mr. J. Cross.

SEPTEMBER 27.—Ludlow Agricultural Society. Meeting at Ludlow. Entries close September 3. Secretary, Mr. T. Weyman, Ludlow.

OCTOBER 3.—Ryedale and Pickering Lythe Agricultural Society. Meeting at Kirby Moorside. Entries close September 15. Secretary, Mr. J. H. Phillips.

OCTOBER 4.—Bakewell Farmers' Club. Meeting and Show at Bakewell. Secretary, L. Furniss.

OCTOBER 5.—Bedfordshire Agricultural Society. Meeting at Bedford. Entries close September 15. Secretary, Mr. T. W. Turnley, Bedford.

OCTOBER 5.—South West Middlesex Agricultural Society. Meeting at Heston. Secretary, Mr. Gotelee.

OCTOBER 16.—Leominster Agricultural Society. Meeting at Leominster. Entries close September 28. Secretary, Mr. T. W. Davies, Leominster.

DECEMBER 6.—Gloucestershire Agricultural Society. Meeting at Cirencester. Secretary, Mr. E. Trinder, Cirencester.

DECEMBER 11, 12, 13, and 14.—Smithfield Club Cattle Show at Baker-street, Portman-square. Entries close November 10. Secretary, Mr. B. T. B. Gibbs, Half-moon-street, Piccadilly.

DECEMBER 10 to 15.—Various Meetings of the Smithfield Club, Royal Agricultural Society of England, and Central Farmers' Club, at their several offices in London.

DECEMBER 11, 12, 13, and 14.—Birmingham Cattle and Poultry Show, at Birmingham. Entries close November 10. Secretary, Mr. J. Morgan, jun., Bennett's-hill, Birmingham

[We shall continue to amend and add to this list as other Societies arrange their meetings. In forwarding us such information, we shall be obliged by Secretaries stating *when* the entries close, and whether the competition is limited or open. —EDITOR *M. L. E.*]

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THE FARMER'S MAGAZINE.

SEPTEMBER, 1855.

PLATE I.

A HEREFORD STEER,

THE PROPERTY OF HIS ROYAL HIGHNESS PRINCE ALBERT,

For which a prize of Ten Sovereigns was awarded at the Smithfield Club Cattle Show, December, 1854, and the first prize of Ten Sovereigns in class 2, at the Birmingham Cattle Show, December 1854.

This animal was fed at the Norfolk Farm, Windsor Great Park, under the direction and management of Mr. James Brebner, and was shown only at London and Birmingham, where it took the prizes above mentioned. It was under three years old when exhibited. It was purchased by Mr. Thumwood, of Eton, and its dead weight was 160 stone of 8 lbs. to the stone, with 20 stone of loose fat.

The baron of beef cut from this animal was presented by Mr. Thumwood to the Emperor of the French; in return for which His Imperial Majesty honored the donor with a handsome Gold Medal.

PLATE II.

THE KNIGHT OF ST. GEORGE; WINNER OF THE ST. LEGER, 1854.

The Knight of St. George, bred by Mr. St. George (from whom he takes his title) in 1851, is by Irish Birdcatcher, dam by Hetman Platoff out of Waterwitch, by Sir Hercules; her dam Mary Anne, by Waxy Pope out of Witch, by Sorcerer—Precipitate, by Highflyer.

The Knight of St. George is a beautiful blood bay horse, standing fifteen hands and an inch high; he has a very neat thorough-bred head, as well as neck, which he bows or arches in walking; he has a clean, light shoulder, well-thrown back, fair ribs, good back and quarters, with great power; he has good arms, hocks, and thighs, is short and sound on the leg, and altogether a low, lengthy, and very handsome nag. He has a small star of white on the forehead, and a few white hairs in a full bang-tail. In temper, the Knight of St. George is said to be the most even and delightful, although in public he has not always shewn this to the best advantage.

AUTUMN FALLOWS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

There can hardly be a more opportune time than this to consider what new observations have recently appeared on the subject of the autumn cleansing of stubbles. My readers, accustomed from their boyhood to encounter weeds on all soils and situations, contending against them as the chief obstacles to profitable farming, will hardly deem any theme more interesting than this—any on which they have bestowed more thought, with perhaps such few satisfactory results. The early philosophers did not omit to notice these things; they found in each locality a peculiar flora—weeds growing in all places, shrubs in many gradually overpowering these; and then the trees of the forest coming next, gradually starving or smothering the undergrowth of shrubs, as these had previously supplanted the wild grasses and herbs.

As man naturally enough tries to account for these things, and yet is too often content to explain unknown facts by mere verbiage, so these early sages gravely remarked to each other, that the masses of plants which arose from the earth in every spring, and almost after every shower, came forth thus apparently spontaneously, because

"nature abhorred a vacuum": they even gave certain ludicrous prescriptions for filling that vacuum at man's mere will and pleasure, without sowing seeds or inserting plants. In a subsequent age, when the world began to perceive that the observation of nature was a surer road to sound knowledge than the mere speculative reasonings of the olden time, certain facts attracted the attention of the searchers after truth, which bear upon the origin of certain plants—such as the appearance of white clover and other grasses after a fire; and the appearance of other plants, such as the white mustard and the wild persecaria, where certain earths were spread over the surface of the land, even although that earth had been procured from great depths. Again it was noted that certain weeds accompanied the growth or followed after particular cereal and leguminous plants; that the cornflower nestled amongst the wheat, the poppy haunted the pea and the tare, and that couch or twitch grass ever followed in the train of the cultivated cereals. When the chemical philosopher began to extend his researches amid the farmers' fields, several interesting chemical observations were made by him, which, if not altogether satisfactory, tended at least to better and more certain results than heretofore. The appearance of the white clover where fires of wood had taken place, for instance, was attempted to be explained by the fact that phosphate of lime is contained in considerable proportions in this and other of the more valuable cultivated grasses, and that this salt abounds in wood ashes. The ashes, then, contained the direct food of the plants which thus made the ashheap their place of growth (whence the seeds came is of course another sometimes difficult question to determine). This supposed influence of the phosphate of lime received considerable support from the subsequently ascertained fact that when the farmers dress many of their grass soils with bone-dust (in which phosphate of lime is *the* fertilizing portion), white clover speedily makes its appearance in their fields in as great a profusion as upon the site of a wood fire.

These observations have been since continued and extended; and more recently many important remarks of still more practical tendency have been recorded. Many such are dispersed in the prize essay of Mr. James Buckman, on the natural history and agricultural economy of the British grasses (*Jour. Royal Ag. Soc.*, vol. xv., p. 462). It is a paper to which I may shortly have occasion to recur; but in these observations I shall refer only to that portion of his valuable work which relates to the influence of certain modes of cultivation upon the spontaneous production of the grasses; and I am the more desirous of doing this, since I feel much induced to believe that by following this path of inquiry we shall yet gain greater knowledge. He tells us truly enough that the differences between good as compared with bad pastures, are in many cases the result of attention and good cultivation. Let us, for instance (he observes), suppose a poor clay ameliorated; we must not then expect that its list of grasses will remain the same, or in the same proportions to each other; on the contrary, bad grasses, which are ever present to a greater or less extent in every pasture, will nearly all die out; or if not so, they greatly improve in quality; whilst many good ones, of which scarcely an example could be found before, rapidly increase. And, again, the many herbaceous plants distinct from grasses, such as Plantago media (broad-leafed plantain), Bellis perennis (common daisy), Ranunculus bulbosus (bulbous crowfoot), and many others, give place to a growth of grasses. This may be more particularly observed in lands set apart for irrigation, as in such cases the changes are often very rapid; hence observations of such cases are very instructive. Take (continues Mr. Buckman) the following example of a meadow in the neighbourhood of Cirencester, a part of which is now under irrigation:—The meadow observed upon is on the banks of the Churn, and, from its slope, only half of it could be covered with water. It has a subsoil of oolitic gravel; so that although vale land, its produce was that of a thin upland pasture. How much it has changed will be seen from the following table, which is intended to supply information on the following points:—1, the names of the grasses observed; 2, the proportions of these observed in the meadow before irrigation; 3, the changes effected in two years; 4, those on the fourth year:—

Grasses.	PROPORTIONALS.		
	Before irrigation.	After 2 years' irrigation.	After 4 years' irrigation.
Meadow foxtail	1	2	4
Field meadow..	2	3	4
Roughish meadow	1	2	1
Quaking	2	—	—
Dog's-tail.....	2	1	—
Hassock	1	—	—
Marsh bent....	1	2	3
Cock's-foot	1	2	3
Yellow oat	2	3	3
Soft oat	1	1	1
Meadow barley	1	2	2
Perennial rye ..	2	4	6

This table (adds Mr. Buckman) shows us that all the better grasses have increased, if we except the roughish meadow grass and the meadow barley

grass, in which there has been an increase in grasses not possessing the best character. If we take into consideration the same set of facts as presented by herbs of other families, the alteration is still more striking, as may be seen by the following table:—

Grasses.	PROPORTIONALS. Before irrigation.	After 2 years' irrigation.	After 4 years' irrigation.
Upright meadow crowfoot	1	3	1
Bulbous crow-foot	3	1	—
Narrow-leaved plantain	3	1	1
Broad-leaved plantain	3	—	—
Dutch clover ..	2	—	—
Broad clover ..	1	2	2
Common-beaked parsley	1	2	1

Without dwelling more, on this occasion, upon the effects produced in the growth of the natural grasses, by altering in some degree the composition of the soil, either by irrigation or by the addition of certain fertilizers (an inquiry from which I feel much that is important to the farmer is to be hereafter derived), let us turn to the lately published result of the experience of a practical farmer upon the autumn cleansing of stubbles. This, remarks Mr. E. Agate, in his prize paper (*Jour. Royal Ag. Soc*, vol. xv, p. 110), is one of the most important questions in agriculture. By attention to this point, the tenant is enabled to farm his land to the greatest advantage; to it may be attributed the diminished cost of the turnip-fallow, and the introduction of supplementary crops in our rotations, two of our greatest modern improvements—than which nothing requires a greater display of judgment on the part of the farmer, or a more thorough knowledge of the land he cultivates.

"The theory," says a late agricultural writer, "on which this early culture is recommended, is that couch immediately after harvest is comparatively weak, and has not extended its roots far beneath the surface; but as soon as the crop is removed, and the couch so permitted to grow without obstruction, it spreads rapidly along the surface, and penetrates deeply beneath it, and every week that it is left undisturbed renders its extirpation more difficult and expensive. Tear it up early, and the seedlings are at once shaken out entire from the tender soil; leave it to strike deeper root, and every broken fibre that remains strikes afresh, and gaining strength throughout the winter and early spring, gives the farmer at that busy season the expense of a second fallowing. The advantage of this early preparation is attended with this further benefit, that only one furrow is requisite in May, and the ground not being deprived of its moisture at that season, the turnip-seed is sure to vegetate at once." The subject therefore may be entered upon boldly, and the test of economy be rigidly enforced. This ought to be applied by every one who pretends to write upon an art or to put theory into practice.

Without attempting to consider the whole of the objects included in Mr. Buckman's essay, let me merely quote his observations on two points: first, then, as to forking up couch by hand labour. "This is done immediately after the corn is carried, beginning with that portion of the fallow where a winter green crop is to be taken, which should be the cleanest stubble on the farm. This must be looked over carefully, all running weeds, and such as cannot be killed by the plough, being spudded up and carried off the land. It may be done by men or women provided with forks, followed by boys with baskets, who pick up the weeds as dug, and when they have filled their baskets, deposit them in heaps at the ends of the lands, to be disposed of in the most convenient manner. The expense may vary from 1s. to 10s. per acre. A friend of ours says—'We think spudding cheapest so long as it can be done for 5s. to 8s. per acre, after which limits horse-labour must be used. No farmer should be satisfied with the condition of his farm till looking over with spuds after harvest leaves the land clean enough for the plough.' This is impossible, however, on heavy land. Where running weeds abound, the methods which are mentioned hereafter are to be preferred; for forking, though the most effectual, is the least economical method of cleaning, and the number of acres to be got over in a day very limited. Great care should be taken that nothing is left in the furrows, for this, when ploughed in at a usual depth, is not killed, but when the land is opened in the spring, is found to remain in full vigour, and is then far more difficult to eradicate. The weeds over which the farmer has to exercise the greatest vigilance are couch-grass, several species of agrostis, knot-grass, crow's-foot, colt's-foot, mint, bindweed, docks, and thistles."

And secondly, where he refers to the successful practice of the Messrs. Outhwaite, in the North Riding of Yorkshire, as described by Mr. Caird, as a type of the system followed on the strong turnip soils of the North and Midland counties of England. "The great aim in the culture of the farm is the early preparation of the land intended for the turnip crop; to this all other work is postponed after the corn crops have been secured in autumn. The stubbles are then stirred in one direction by

Biddle's scarifier, the sharp-pointed tines being used in this operation, and the ground torn up to the depth of 5 or 6 inches. After the field has been gone over once, the scarifier is fitted with the broad-share tines, and made to cross the former, stirring at right angles, thus tearing the ground to pieces, and disengaging the stubble and roots of weeds and couch, which are drawn together on the surface by the harrows, then gathered by the horse-rake, and laid in a heap to be carried home for littering the cattle yards. The land, now thoroughly pulverised, is ploughed with a clean deep furrow, and in that state is left exposed to the influence of the weather till spring, when it receives one furrow more, and is found in fine condition for vegetating the seed of the turnip crop. The swedes are sown on the ridge 28 to 30 inches apart."

In thus concluding my essay with the remarks of a practical farmer upon the removal of weeds from arable soils, I do so because I feel that in the present state of our knowledge we must be content to remove from our lands those weeds whose appearance in such general profusion it would be so much more advantageous to *prevent*. On this branch of a most interesting inquiry there is evidently much yet to be accomplished; and although the facts bearing upon the attainment of such a result are not so numerous as is desirable, yet still what has been hitherto noted in this way may well incite the chemist and the skilful farmer to continue his observations and experiments; and it is certainly encouraging to know that on the majority of our lands, as the soil is enriched by artificial means, a more valuable tenantry of natural grasses seem almost invariably to follow as it were the wheels of the manure cart.

THE LATEST ATTEMPT TO COLLECT THE STATISTICS OF AGRICULTURE.

This is the age of innovation! Established modes of thought and of action are all giving way before the onward march of change: our whole manufacturing and commercial system has been completely changed in the course of little more than one generation: steam has wrought a revolution in the commercial and manufacturing system of England: the steamboat, the railway, and the electric telegraph are bringing opposite hemispheres into closer connexion than the more distant parts of our own island enjoyed in the days of our grandfathers. Agriculture has partaken of the movement. How different is the estimate of what constitutes good farming now and at the accession of George the Third. Our races of domestic animals have been re-modelled, our system of cropping has been revolutionised, bare fallows have given way to alternate grain and green crops, and it has become evident that by the joint action of these two causes on a well-cultivated light land farm, more grain is produced and more live stock maintained than the same area would have yielded of either, under the old system of crop and bare fallow. Machinery and the steam engine are extending their dominion over agricultural as well as manufacturing industry. We have long thrashed by steam power in some districts, and its use is daily increasing. We have draining ploughs worked by steam. A few daring innovators are distributing there manure in the liquid form by steam power, and labouring to supersede by a cheaper operation, all the turning, and filling, and carting, and spreading, which have hitherto been found indispensable for the dressing of our fields. A few, more sanguine still, are attempting to plough by steam. But, putting these modern innovations out of the question, and recurring only to those which commenced at the close of the last century, it is evident that the produce of our soil has greatly increased. It is evident, also, that the demands upon it have increased to a greater degree, and that a large population has grown up dependent on foreign supplies of food. The wish to ascertain the extent of this dependence, after each harvest, has given rise to the greatest agricultural innovation of all—the attempt to commence a system of agricultural statistics, and to obtain annual returns of the produce of the soil. How would such an innovation have startled the farmers of half-a-century ago! when it was considered that they were in possession of certain secrets which it was desirable to conceal from their landlords, and when agricultural societies were deemed as hostile to the interests of the farmer as the collection of agricultural statistics is considered by many to be at present. Notwithstanding this feeling, the attempt has been made. We have the agricultural statistics of Ireland and of Scotland for the past year; and have collected, by way of experiment, those of a few counties in England. Different systems have been pursued in these different portions of the United Kingdom. In Ireland the task of collection has been committed to the constabulary, for no other reason, that we are aware of, than their ubiquity; in Scotland it has been undertaken by the Highland Society; in England, the Royal Agricultural Society having declined the task, it has been confided, by way of experiment, to the Poor-law

Boards in a few districts. The Irish and Scottish returns present this anomaly—that the acreable produce of several crops comes out greater in Ireland than in Scotland. Scottish farming is vaunted all over the world; that of Ireland enjoys a less enviable notoriety. How are we to explain the anomaly which the returns manifest? Are we to infer that the rotation in which potatoes constitute the only fallow crop, and are followed by corn, repeated till the produce barely exceeds the seed, when the land is left to repose under such pasture as spring up spontaneous, is, after all, the true mode of cultivation? If so, the sooner we dissolve our agricultural societies the better, and retrace our steps towards the good old system of our forefathers. Is the climate of Ireland the cause of the anomaly? Are we to refer it to the prevalence of spade cultivation over the use of the plough, or to some lurking fallacy caused by the size of the Irish acre? We are inclined to attribute it to the latter cause. The farmers of Ireland, and the class from which the constabulary are taken, have no idea of any other; and though all the public valuations have reference to the statute acre, it is very rarely that agreements for land have that for their basis. We have even heard it asserted that to attempt to let land by the statute acre would produce a rebellion. It is therefore very possible that the produce of the Irish acre has been sometimes returned as that of the statute acre, and that they on whom the task of reducing the returns devolved may have had no means of detecting the error. It is not in the acre alone that these anomalies exist. We noticed, on a former occasion, the varying capacity of the Irish measure termed the "barrel," which prevails to such an extent as to render it impossible for one not acquainted with the local customs to ascertain from the returns he may read in a newspaper the price of corn or potatoes in different contiguous markets. Anomalies of those measures of produce to which the farmers and the constabulary are accustomed, may have contributed, as well as the different areas of the Irish and statute acres, to swell the return of Irish produce. It is therefore of the utmost importance in this respect, as well as for other important reasons, to establish an uniformity of weights and measures throughout the United Kingdom. Some portion of the discrepancy may, perhaps, be ascribed to the different bias which may unconsciously have affected the collectors of the returns.

Estimates of the produce of crops must be received with caution, even when made by those who have much experience in the business. They are but good guesses at the best. The farmer who makes them for his own crops, has the advantage of checking his estimate by his subsequent knowledge of the actual yield. Professor Johnston, in his "Notes on North America," shows with respect to the much-vaunted returns of the Patent Office, the collector of statistics of all kinds in that country, that comparing the estimated produce of the year with the subsequent exports, and the probable consumption of the population, there remains a considerable excess in the estimates over the actual produce as thus deduced. In this country we shall have means of checking the estimated produce of each year, by comparing it with the imports and with the numbers which they jointly feed. But while we shall, in this way, obtain in time means for checking even imperfect estimates of growing crops, by ascertaining the rate of error in the estimates of produce, there can be no doubt that the more accurate our returns can be made in the first instance, the greater will be their value. If, therefore, we are to have statistics of the produce of the soil, it is an illjudged economy to employ imperfect machinery in their collection.

There is no class more interested in obtaining early and accurate knowledge of the probable yield of the current year than the farmers themselves. It may often prevent them from forcing their crops precipitately into the market in consequeuce of the prospects of abundance founded on their knowledge of their own immediate neighbourhood alone, for the improved means of transport have now brought the remotest parts of the island into close contact; and on the other hand, such knowledge may often prevent them from holding back when a good price is offered--a good price, in the expectation that prices will advance, keeping their corn two or three years, and then selling it for half the price which they had previously refused.

Some remarkable cases of this kind came to our knowledge in connection with the high prices occasioned by the Irish famine in 1849.

Enough has been done already in the collection of the statistics of agriculture to satisfy the farmers that a knowledge of the general produce of a district may be obtained without exposing secrets of individuals, and we hope another year will not be suffered to elapse without obtaining in England that knowledge which has already been obtained in Scotland and Ireland, and collecting it in a more perfect form, by availing ourselves of the experience furnished by these preliminary at tempts.

COMPARATIVE PRODUCE OF DIFFERENT KINDS OF WHEAT.

DEAR SIR,—Conceiving that any information on the subject of wheat, that will throw light on the produce, will be acceptable to your readers, and especially those in the mealing trade, I beg leave to hand you the following comparative statement, with which I have been favoured by a friend in that trade, chiefly the results of trials carefully conducted under his own inspection :—

COMPARATIVE STATEMENT OF THE PRODUCE OF TEN QUARTERS OF DIFFERENT KINDS OF WHEAT.

No.	Description.	Weight per bush.	Whites.	Households.	Seconds.	Middlings.	Offal.	Waste.
		lbs.	st. lbs.	st. lbs.	st. lbs.	st. lbs.	st. lbs.	st. lbs.
1.	Norfolk red, sprouted	52½	—	147 4	—	70 3	31 3	1 4
2.	White Dantzic, fine	57		244 6	17 2		58 10	4 2
3.	Revetts	59½		240 10		83 2	56 6	—
4.	Rostock	60		248 8		27 0	64 12	2 6
5.	White Whittington	60	217 2	48 2	13 2	—	59 2	4 12
6.	Essex	60	250 0	13 11	21 1	2 2	58 1	7 5
7.	Essex and Suffolk, mixed..	61½		272 10		20 0	59 10	Included.
8.	Petersburgh, hard	62½		295 10		35 10	47 2	Ditto.
9.	Ditto, soft	63		247 2		64 4	47 2	Ditto.
10.	Talavera, fine	63	233 5	39 7	15 10		69 3	2 2
11.	White Norfolk	63	265 0	15 4	10 10		63 0	6 0
12.	Spalden's ditto	64½		243 0	53 2		64 8	7 12
13.	Spanish, hard	64½		115 2	—	239 10	24 8	0 8
14.	Old Red Norfolk	65½		280 0	11 11	20 7	59 1	3 0
15.	Cape of Good Hope, white.	66	277 2	35 10	—	10 0	51 6	2 12

I shall now proceed to make a few observations upon these specimens, which I trust will be deemed neither irrelevant nor useless; taking them *seriatim* as they stand in the schedule, according to their weight per bushel.

No. 1. I have introduced this sample into the table in order to illustrate the difference in produce between a wet and a dry harvest. It was grown in the memorable year 1800, when there was not a sound sample of wheat harvested in the whole kingdom. It was of the same species as No. 14, with a difference of 13 lbs. per bushel in weight—the consequence of being sprouted. This, however, does not represent, by far, the difference in product of flour, as the following statement will show :—

	No. 1.	No. 14.
	st. lbs.	st. lbs.
Flour, per quarter . .	14 10	29 3
Middling, ditto . .	7 0	2 1
Offal, ditto . .	6 2	6 0

Thus the sound dry wheat produced just double the quantity of flour of the sprouted, the middlings from the latter being so inferior as not to be worth grinding into seconds; whilst those from the former produced good seconds, and the residue were still available for coarse biscuit. Thus a wet harvest not only produces a damaged and inferior quantity of corn, but lessens almost incalculably the quantity of produce by exhausting the substance of the grain. To such an extent was this the case in 1800 (as the above specimen will prove), that the people were driven to the necessity of substituting barley, oats, peas, &c., in the making of bread; and all the quality of the bread thus made was so loose in texture as to be eaten with a spoon instead of being cut in slices with a knife. This was, perhaps, the most trying year to the nation, of the last war; and its calamities drove Addington's government to patch up the peace of 1801 with the French Directory, so soon to be broken by the latter.

No. 2. The weight of this fine Dantzic is only 57 lbs. per bushel, and the produce about 25½ stones per qr.; whilst the offal is nearly equal to that of No. 14, being 5 st. 12 lb. per quarter. It is evident that this wheat, which always bears a high price, is not a profitable article to grind alone; but it is exceedingly useful for mixing with other wheats in small proportion, imparting both strength and colour to the flour. This wheat is chiefly brought down the Vistula from Prussian Poland.

No. 3. This coarse wheat is chiefly used in the making of Colne's flour for the London market, where the bakers use it in dusting their kneading-boards. For breadstuff it is seldom purchased, except in very dear seasons, when the working-classes want a cheaper article of flour. The millers, however, do not scruple to mix a small proportion of it in their households.

No. 4. Rostock, like the Dantzic wheat, is chiefly used for mixing; but the quality is very inferior to it, and the price proportionate.

No. 5. The Whittington wheat was formerly grown extensively in Norfolk and Suffolk, where it was a great favourite, and deservedly so, with the millers; but not being a profitable wheat to the farmers, they have discontinued its growth. The quality of this species was very superior, as will be seen by the large proportion of whites and households it produced. Indeed, the quantity of flour it yielded in proportion to its weight was

greater than any of the others, except No. 15, and the quality appears to have been equal to that.

No. 6. This is well known as a profitable wheat to the miller, and it always commands a high price in Mark Lane, every particle containing flour being available.

No. 7. This mixed sample is of the same weight as the last, the produce in flour rather greater, which probably arose from its being converted into households instead of whites. It is a profitable wheat, and the quality excellent.

No. 8. This hard wheat is too steely to be profitable to the miller, unless at a low price, and for a coarse description of flour. The quantity of middlings proves this; but the strength of the flour makes it useful for mixing with weaker qualities, and for this purpose it is generally used.

No. 9. This is a much better description of corn, producing about twenty stones more flour to the ten quarters, and an equal quantity less middlings, the offal and waste exactly the same. This wheat is chiefly grown in the Russo-Polish provinces.

No. 10. The Talavera wheat is now almost extinct, being quite out of repute and favour with the farmer on account of its liability to sprout when ripe in the field. It is also less productive than many other kinds under similar culture, and therefore less profitable. These facts are much to be regretted, for certainly there is no other species of wheat can compare with it in quality of flour, or profit to the miller and consumer; as it will yield a large amount of the finest flour per quarter, and the largest amount of bread per sack of any kind of wheat I know of, with the exception of No. 15, of which but little has ever been imported.

No. 11. This can scarcely be called Norfolk wheat, as the constant changing of the seed of white wheat by the Norfolk farmers renders it difficult to trace the origin of a particular sample. It was, however, grown in that county, and whether of Suffolk or Essex origin was of excellent quality, yielding a very large proportion of the finest whites, with but a small proportion of offal.

No. 12. This appears to have been a good yielding grain that worked up into flour very closely, the proportion of offal being small.

No. 13. This hard Spanish wheat does not appear to have met with proper treatment from the miller, otherwise the middlings and flour would have exchanged figures. I have known this description of wheat *yield a greater weight of flour than that of the grain before the process*, whilst the weight of offal was incredibly small. As it is probable that we may have some quantity of hard Spanish wheat this year, it would be well for the millers to make themselves acquainted with the best mode of manufacturing it, being peculiarly adapted to coarse flour and Colnes.

No. 14. The old Norfolk red, which may be considered the very original stock introduced by the Romans at the time of their occupation of Britain, will never be excelled for profitableness to the farmer or miller. It is peculiarly adapted to the dry light soils of Norfolk, but does not lose its character when transported to other soils. In the latter case, however, it requires to be occasionally renewed, otherwise it is liable to be inoculated with the fallen from other fields, which would deteriorate its quality, or, at least, change its character. In Norfolk it has maintained that character for ages, and will probably continue to be a favourite with the farmers of that county, on account of its adaptation to the soil.

No. 15. This is a species of which we obtain but a small quantity. The weight was very great, and the produce of flour in proportion. The enormous quantity of the best whites shows the fine quality of the wheat, whilst the very small proportion of offal illustrates the advantage of heavy over light wheat. There is, in fact, no comparison; and whilst heavy wheat cannot be purchased (in reason) too high, a light quality almost always fetches more than it is worth.

Let us take, for instance, No. 2, weighing 57lbs. per bushel, the produce of which is 263 st. 8lbs., or 26 st. 5lbs. per qr. The Cape wheat, on the other hand, weighs 66lbs. per bushel, and produces 312 st. 12lbs., or 31 st. 4lbs. per qr. Here is a difference of nearly 5 st. per qr.; but the superiority of the latter wheat will show in a stronger light if the quality of the flour also is estimated. Thus :—

	£	s.	d.
Dantzic: 244 st. 6lbs. households, at 60s. per sack.	36	13	3
" 17 st. 2lbs. seconds, at 50s. ditto	2	2	10
10)	38	16	1
Per quarter.....	3	17	7

	£	s.	d.
Cape: 277 st. 2lbs. whites, at 65s. per sack	45	0	6
" 35 st. 10lbs. households, at 60s. ditto ..	5	7	1
10)	50	7	7
Per quarter.....	5	0	9

Difference in favour of Cape wheat, 23s. 2d. per qr.

Such are the deductions I have drawn from these experiments, which I hope will afford your readers some amusement, if not instruction.

Yours, &c.,

AN OLD NORFOLK FARMER.

London, Feb. 9, 1855.

SCOTCH LANDED PROPRIETORS.—The following is the gross total number of landed proprietors standing on the valuation rolls of the various Scotch counties in 1854, viz., in Aberdeen, 341; Argyll, 181; Ayr, 456; Banff, 45; Berwick, 306; Bute, 9; Caithness, 37; Clackmannan, 35; Dumbarton, 263; Dumfries, 510; Edinburgh, 562; Elgin, 55; Fife, 686; Forfar, 358; Haddington, 124; Inverness, 120; Kincardine, 92; Kinross, 164; Kirkcudbright, 413; Linlithgow, 164; Nairn, 15; Orkney, 329; Peebles, 88; Perth, 696; Ross, 69; Roxburgh, 429; Selkirk, 43; Stirling, 615; Sutherland, 8; and Wigtown, 60. 594 of these estates were valued at between £500 and £1,000, 387 at between £1,000 and £2,000, 274 at between £2,000 and £5,000, 76 at between £5,000 and £10,000, and 32 at upwards of £10,000.

CLEANING OF STUBBLES.

When the Royal Agricultural Society adopted as its motto "Practice with Science," it inscribed upon its banner a great principle, the working out of which will long serve to aid and to elevate the agriculturist. We felt this at Carlisle, when visiting the noble Show Yard of that great meeting; we felt this important truth when we were perusing the last number of the Society's Journal; in fact, it forces itself as it were upon our attention at every turn. To dwell upon an opportune instance, it is only of late years that any general attention has been paid to the autumn cleaning of stubbles. In the number of the Journal to which we refer, a Prize Essay of Mr. E. Agate enforces in a plain practical way the advantages of the coming season for cleansing and deeply stirring the land. He correctly enough lays down the broad proposition (one that few of the great farmers whom we have the honour to include amongst our readers will controvert) that the best and surest foundation of *clean farming* is an unremitting attention to the autumn stubbles; that the good effects of such attention may be seen throughout the course; that it is the way to make the rest of the task comparitively easy; and that the gain will be made apparent by the ameliorated condition of the soil, whereby it requires less cultivation, and yields greater crops of superior quality. The explanation of this, the science of the practice—for we must confess we like to try to understand the reason for every suggested agricultural improvement—amongst other things, is this: it stops the growth at least, if it does not kill, the roots of weeds at the earliest practicable period—a growth, be it remembered, which continues at all seasons; it allows of the completion of the fallow at a moister period, and hence the soil, being less dry, is in a much better condition for accelerating the rapid vegetation of the seed; it is neither reduced to dust, nor, in the absence of rain, a mass of half-cleansed clods. To reap the greatest advantage from autumn cleansing, however, it should be commenced as early as possible after harvest, even to the postponement, in some cases, of wheat sowing. We must not, however, conclude that the advantages of the autumn ploughing and cleansing of stubbles are confined to the mere removal of the weeds only—to the saving of the food of these pests, for more honest plants, nor to the more advantageous results of "getting the work forward;" for, considerable as are all these advantages, the man of science yet finds other reasons for advocating the early pulverising and cleansing stubble soils.

In a subsequent page of the same work will be found a lecture upon the atmosphere as a source of nitrogen to plants. To this inquiry, full of difficulties, and fraught with matters of the deepest interest to our readers, we can hardly assign too high a value. The author of that address evidently felt all this, as he proceeded; his course was beset with phenomena, that seemed suggestive of more than one only half-concealed truth; but he trod warily, and after showing that ammonia (nitrogen and hydrogen) is found in the air, in the waters of the sea and of rain, in the soil, at the surface, and in clays twenty feet from that surface — after tracing it throughout all these, he hesitates to explain how it comes to be found in such places, how it is generated. He believes that the nitrogen of the atmosphere, however, is absorbed by plants in some form or other, and *we* believe that the nitrogen of the atmosphere is directly employed in the formation of ammonia, in a manner which Professor Way will one day be able to explain. In the meantime we may be content with the well-ascertained facts, that a considerable, but as yet uncertain quantity of ammonia and nitric acid exists in the air, and is brought down by rain; that, it is larger in amount in cities than in the country, in the water of fogs and dews than in rain, and in the first showers than in those which fall subsequently; that, as a consequence of the existence of ammonia in rain water, it is found also in the water of streams and rivers, and further on still in the great ocean; and as illustrative of the question of autumn cleansings of the soil, that this ammonia is absorbed by the soil from the atmosphere, and that this absorption is promoted and extended by deep and the earlier commenced stirrings, and by the increased pulverization of the land. The experiments of M. Boussingault showed pretty clearly that plants acquire nitrogen in some form from the air; but they did not determine whether it was the atmospheric nitrogen gas, or whether it was derived from the ammonia—this blank, adds Professor Way, M. Ville endeavoured to fill up in our knowledge of the processes of vegetation. He employed hermetically closed glass cases, and in these he operated upon cress, lupines, rape, wheat, rye, and Indian corn; the result of these carefully-conducted experiments was, that the crops in most cases contained considerably more nitrogen than that present in their seeds, and (as ammonia) in the air supplied

to them. He thus arrived at the conclusion that plants assimilate the atmospheric nitrogen. In a subsequent series of experiments, M. Ville adopted measures to deprive the air, before entering the cases, of all the ammonia which it contained, so that any gain in nitrogen of the produce over that in the seeds could not be traced to the agency of ammonia. The result was the same as before: the gain of nitrogen was undoubted. The truth or otherwise of these deeply interesting enquiries, however, need not divert us from the important practical facts which they serve to illustrate; since, whichever way nitrogen is assimilated by plants, the rapidity of that assimilation is, we are well assured, promoted by the increased freedom with which the atmospheric air circulates through the soil, and by the depth to which it freely penetrates.

THE EFFECT OF THE WEATHER UPON OUR HARVEST PROSPECTS.

In a former article, we referred to the effect of the weather upon our harvest prospects, and the stocks on hand to meet the demand up to that period; and as an influential journal writes rather despondingly upon the subject, we consider that the question has become an open one—not only for producers, but for consumers also. "What are harvest prospects in your district?" has become a question "familiar as household words" among farmers. And "what are harvest prospects throughout the country?" is, or ought to be, a question of first consideration throughout the kingdom—at all times a momentous one, but especially at the present moment, when war is influencing the larger portion of the corn-producing districts of Europe, and when this Kingdom, more than at any period within the past thirty years, has become dependent upon her own resources for the support of her densely populated districts. It may be very true that the money of England will always produce wheat, if it is to be had anywhere upon the face of the habitable globe; the price may yet become enhanced to a proportionate extent, until under existing circumstances it may actually be placed out of the reach of the poorer classes, still—as recorded by Stowe in a severe famine that took place in his time "those who had money suffered not"—upon such an event again happening, a like result might again follow. Still we have reason to fear that high prices, coupled with that stagnation in trade and manufactures that would inevitably follow in their train, might produce a degree of discontent and misery that would give occasion of alarm to the government and to all the influential classes of this kingdom.

The *Times* observes that "the heavy fall of rain which has arrived at this, the most critical period of the year, comes to remind us that by the war the area from which we derive our supplies becomes diminished. We are reminded by the rain that it is about this season of the year that potato-blight has on former occasions developed itself, and that a few heavy showers may now do an amount of injury that may have an important effect upon the price of food for the coming year." And, in continuation—"We do not mean to prophesy that this is likely to be the case; we only wish to point out that it may be so, and that we should be unpardonable if we left any means untried for averting so serious a result."

We so come again to the question "What are the harvest prospects of the kingdom at large? and what is the tendency of the present state of weather towards the final result?" And therefore, so far as we have been able ourselves to examine and to collect information from various parts of the kingdom by persons competent to give it, we are decidedly of opinion that the acreable yield of the wheat crop will be far below that of the preceding year, whilst the lateness of the harvest will tend to its not being collected in such fine order for immediate use. The probability is that it will not, except to a limited extent, be obtained at first in grinding condition; and after all, with our short-comings from foreign ports, and exhausted stocks of our own growth, this must and will be the main element under consideration; for supposing that the wheat crop may be an average one, still, with a wet and untoward harvest, should the main portion of it not be available for use until the following spring, it would produce an effect almost as injurious as a deficiency of the crop itself, and greatly more disastrous than if all foreign supply was suspended for a like period.

By this very day upon which we write, to the close of July, twice within forty years, the harvest upon a farm under our eye was concluded; and we now calculate that, under the most favourable circumstances, it will barely be commenced within twenty days from this time: this will under ordinary circumstances bring us to a period when the sun will have far receded, and under the anxiety of agriculturists the oppor-

tunity of gathering in the crops will not be thrown away, irrespective of their being in first-rate order and condition. We are not desirous by advancing this opinion to alarm the public mind; for we have no hesitation in acknowledging that upon an average of seasons, the month of September has been found the driest and most genial weather throughout the year, and Heaven grant it may be so in the one forthcoming.

As regards the productiveness of the crop, we rather incline to the opinion that it will be of an average yield. Upon examination, the ear from the bottom to the top is less defective than usual. The wheat is generally healthy in appearance, and less affected by rust or parasitic fungi than we have for some years observed. There is also less atmospheric tendency towards mildew than usual; and notwithstanding the heavy and continuous rains experienced generally throughout the kingdom, the crops have not in appearance suffered beyond being beaten down. This, we admit, must have a tendency, at the least, to produce an inferior sample, and consequently a deficiency in weight and mealing properties. Upon the heavy clay lands of the kingdom, the wheat crop will be unusually heavy; it is full in plant, and the ear for the most part well filled. The straw is also stiff, and has been able to resist the effects of the battering storms to which it has been subjected. Upon the light gravelly and mixed soils deficiency of plant prevails to a great extent; and upon the light sand, thin chalk, and peat soils, much of that which was sown has been ploughed up. Still upon the whole, we have no hesitation in repeating that the kingdom will produce an average crop of wheat; but we are also of opinion that the lateness of the harvest may probably render the largest portion of the crop unavailable until the ensuing spring. Should, however, sunshine predominate, England will have nothing to apprehend from her own resources, whilst under adverse weather she may be deprived of their immediate advantages. But with an abundant crop of every other description of grain, we may still say, *Nil desperandum!* Under whatever circumstances the war may influence our foreign supplies, this country will for the most part be able to dispense with them; and, under the blessing of Providence, we still fear no great amount of harm from anything that our enemies can do.

AGRICULTURE AND RAILWAYS.

When Arthur Young advised the farmers of his day to saddle their hacks, and ride abroad to see what their fellows in more distant parts were doing, he little dreamt what facilities a future age would provide for carrying out his wishes. Few then could afford either the time or the money to attend to his commands. That same "mounting and away" was a tedious, expensive, and often even a dangerous business. There was little, indeed, to tempt him abroad. The gentleman who did start to "see what he could see" went too often without rudder or compass; without a congenial spirit to share with him his pilgrimage, or to explain to him what he witnessed.

It will be his own fault, however, if he does not see something now—if he does not draw some comparison between what he himself is doing and that others are achieving elsewhere. It will not be enough, as the gallant Cincinnatus told Mr. Mechi's audience at Carlisle, to look around from the nearest hill-top, and learn only the art of agriculture from his neighbours. The very cap he draws over his brows, as he settles himself in "the Express," is but the wishing cap of the fairy tale. With this he shall be transported wherever he please—the Lothians shall be no longer a mystery, the fens of Lincolnshire no further a miracle. He shall see and judge for himself, if he so chooses. He must profit by so doing, and, we repeat, it can only be his own fault if he refuses to avail himself of the opportunity.

It is but right to say that our different agricultural societies offer to him every possible inducement. It is only justice to add, that the several railway companies as handsomely support these endeavours. In former times, it was the utmost of his ambition to convey "Cæsar and his saddlebags". Now, however, if he has a beast or a sheep that he fancies is at all superior, the test is easily arrived at. It is, too, not merely a trial, but a market. Many a breeder has to thank the railways for establishing his reputation—for landing his stock in as good a form at some far distant show ground, as he could have brought them out in his own yard. Indeed, if anything, the use has already grown into something of an abuse. Patchy short-horns, heaving Leicesters, and dreadfully distressed pigs, would often be all the better for a little stronger exercise than that the rail has been kind enough to impose upon them.

Within only this last month or two, it has been our duty, as, we may add, it has been a pleasure, to travel some thousands of miles by the different

railways of this kingdom. This, as our readers must know, has been with one especial object—to report what the agriculturists are doing in the many different parts we have thus visited; to ascertain how far they really went with the efforts made on their behalf. We must leave these reports to speak for themselves. Their chief point is, that they form a strong connecting link from one end of the kingdom to the other. That continual comparison which Young would have the farmer make, is made. You meet many of the same men "all the world over." To their credit be it said that generally they note and admit everything that is good in the best spirit, although of course now and then you come across such an habitual grumbler as was once so much the fashion to characterise the English farmer. There was one such turned up almost everywhere this year, and who, with an unmistakeable Suffolk whine, abused everybody and everything; but who nevertheless must have learnt a good lesson, notwithstanding. He has the rail to thank for it.

We have all to thank the rail more or less for thus rubbing us together, and giving us the opportunity to see for ourselves what there really is to attract, and what to avoid. "The different Railway Companies", then, and "thanks to them for their co-operation," is no empty compliment after all. As Sir Stafford Northcote well said, in introducing this toast at Carlisle, as it was once a custom to drink "Commerce and Ships," let it now be an honoured one to give "Agriculture and Railways." There are none, perhaps, who have had a better opportunity of judging how this co-operation has been carried out than ourselves. We are happy to add that the railway companies, so far, have well done their duty. Carlisle, Malton, and Carlow all speak to their credit—and, may we add, to their profit. To be a substantial advantage, this must of course be a reciprocal one. We can congratulate all concerned in expressing our belief that it really is so.

There is no disguising the fact that the success of our agricultural gatherings must mainly depend upon the extent to which they can be "fed" into by the railway companies. In considering this, it is not only a question of site, but of subsequent capability. It is one matter to get your thousands of visitors into a town, and another to provide for them afterwards. The latter is especially worthy the attention of our Irish friends. It is doubtful, on this reasoning, whether Carlow should not, after all, have been Kilkenny. There are some who even in these enlightened times, object to sleep two in a bed with a strange gentleman; and others who have as little taste for eight or ten beds in the same room. This was more or less the order of the night at Carlow; though, fortunately, Dublin was within hail for those whose duties did not call them too early in the morning. Let the rail bring us all it can, but let us be prepared with something of a reception for those it does bring. "You can't put a round of beef on a cheese-plate," argued the substantial citizen when they wanted him to ascend Snowdon on the back of a Welsh pony; and by the same showing, a small town for a great meeting is at best but a mistake.

MR. MECHI, AND HIS "ENTERTAINMENTS."

Every now and then we come on an advertisement in the daily papers, announcing that Mr. Rank Roarer, the eminent tragedian, or Mr. Chaffaway, the popular lecturer, will go to Bath on Tuesday, be at Halifax on Thursday, and so on. Considering what a quick eye our friend Mr. Mechi has to a little harmless notoriety, we wonder he did not take a hint from this. Just two or three lines, well placed, in the *Times*, to say that—"Mr. Mechi will deliver his popular lecture on agriculture at Carlisle, on Saturday, July 21st, and be 'at home' on the following Saturday, July 28th, when a variety of entertainments will be provided on the occasion of his annual benefit." This might have told—though not as much as could perhaps have been expected—at least on the agricultural public. Strange to say, neither of these days were well or even conveniently chosen. The Carlisle lecture would have come much better on the Tuesday or Wednesday in the following week. As it was, few of the early birds already arrived paid the one shilling each for admission. The audience was almost entirely composed of members of the Carlisle Farmers' Club. With these, the man himself, if not his performance, was a novelty; and so the old points went off well enough—"The Battle of Agriculture fought over the body of Mr. Mechi"—Irrigation—Deep Drainage—The Establishment of Companies to Advance Money for Agricultural Purposes—The Waste of Manure—Town Sewage—and the amount of water in men and beefstakes. These, with a touch at Agricultural Statistics and the Valuation of Improvements, bring us on to this end: First, "That the question of Agricultural Improvement is not dependent upon Mr. Mechi's success or failure;" and, secondly, that

"So far as I am personally concerned, I feel some gratification that I have outlived a great storm of ridicule and censure; and when I am about to leave this busy scene, the reflection that I erected the first new steam-engine in my great country, that the first bag of guano was sown by me—ridiculed by my neighbours as a mere peppering of the land—will afford me some gratification. I feel that the publicity of my sentiments has not been injurious to the general welfare of British agricultural progress."

"The publicity of these sentiments" at Carlisle, called up a gentleman of the county, the only one who did speak to the lecture, who disagreed with and rebutted a vast deal of what Mr. Mechi had advanced. The deduction he gathered from what he had heard was this—

"His (Mr. Mechi's) remarks might be perfectly true with regard to Tiptree Hall—he did not dispute the point—and Mr. Mechi might derive great profit from the system, only they did not apply to Cumberland; and if any one doubted the fact, and was induced to follow Mr. Mechi's advice, he would meet with nothing but disappointment. A gentleman took a farm in Cheshire, intending to carry out certain principles. He was a great theorist, but did not know much about the practical art of farming, and fancied that the same system could be carried out in all climates. He was told if he would go up to the top of the nearest hill, and look about him, and see how his neighbours were doing, and then go home and do the same, he would find at the end of the year that he was not very far wrong. Now he (Captain James) would recommend the farmers of Cumberland to make themselves acquainted with the systems pursued in other places, but not to deviate from their own unless they saw good reason for so doing."

So much for Carlisle. On then we come for Tiptree for the next Saturday. When we say that we left Carlisle on Friday afternoon, to travel some three hundred miles, and prepare our reports for Monday, few of our readers but will allow that we had some good reason for our non-appearance in Essex. One enthusiast, by travelling night and day, did just arrive in time, if not for the whole performance, at any rate ready to take his part in returning thanks for the Royal Agricultural Society. In our need, then, we must borrow from the *Times* report, a journal that has always made Mr. Mechi something of a pet. "The London Manager" of last year, after all his many arduous and meritorious duties in the Crimea, and much honour do they bring him, was again at his post; and thus pleasantly does he write the record—

"He took his guests, as usual, into the fields with him on Saturday, and there for several hours occupied, instructed, and amused them by his peripatetic lectures upon everything connected with the cultivation of the soil. This is his forte, and the most remarkable feature of these gatherings. The persuasive tact of the clever tradesman, and his advertising skill, seem to find a new and splendid outlet in this channel. He extols his corn-crops and artificial grasses with the same easy and irresistible complacency as if they were dressing-cases or cutlery in Leadenhall-street. If his visitors had been customers intent on driving a hard bargain with him, he could not have been more communicative to them—more anxious that they should know the outs and ins of everything, and more ready and facetious in his replies. No country but one of shopkeepers can supply such a spectacle as Mr. Mechi, with his white hat, taking some 300 people by invitation through his fields, and stopping at different points to tell them what he has done and what he has not done—what chemistry teaches and how he conforms thereto in his practice—what Tiptree was as compared with its present state, and what he anticipates England will be when every farmer in it follows his pushing spirited example. Men who talk a good deal at random about any subject, however well up in it, will not always be wise and prudent of speech; but the patient drudgery of the crowd extracts something even from these exaggerations and extravagances. It is so with Mr. Mechi and his auditors. They do not swallow everything he tells them, but a good deal goes down nevertheless. He declares that he made £700 of clear return from Tiptree last year, and that his balance-sheet can no longer be considered unsatisfactory. To do him justice, there were fair indications on Saturday that his management is becoming more decidedly economical. Stock, which is at present uprofitable to feed, is not kept by him in any great quantity. Several of his largest sheds are empty—pigs and bullocks in diminished numbers, and the sheep in the fields. His expenditure in the purchase of artificial manures has been safely limited, owing to the high heart and condition of the land, and altogether there is little to be seen to which, looking to the state of the markets, the most prudent farmer need object as wasteful or extravagant. As bad times found him adventurous, good times and high prices induce him to realize, for they overtake him in a position when he is enabled to do so to the fullest advantage."

This, be it remembered, is the survey of a decidedly favourable critic. In addition to this, we may add that the crops, as they are almost everywhere, were said to be looking very promising; that there was the customary trial of modern inventions; and that "the whole concluded" with a banquet, "even more bountifully served than usual." We borrow again from the *Times*, which runs on thus:—

"But, if Mr. Mechi will allow us to say so, this part of the gathering threatens to interfere with its strictly agricultural character. It is assuming too much the appearance of an ordinary city feast, with champagne and toastmaster and vocalists, and heavy civic celebrities bringing down into the country their postprandial platitudes and utter disregard of Lindley Murray. People want in the agricultural districts the sewage of the metropolis, but they can dispense with the things which we have just enumerated—especially the heads of the corporation and their dreadful English. Until now, Mr. Mechi has happily preserved the pleasant harvest-home character of the entertainment with which he winds up his gatherings; but on Saturday the only points which reminded us of that were the speeches of the Rev. Edwin Sidney and Mr. Fisher Hobbs. The former, in returning thanks for the bishops and clergy of the diocess, gave an interesting account of the ravages of the wheat fly; and the latter, in responding to the toast of 'The Royal Agricultural Society," communicated some striking results obtained at Carlisle in the economy of fuel by steam-engines for farm purposes, and in the lighter draught of ploughs. These, and the meeting of the society next year at Chelmsford, with the duties which it entails on the county of Essex, were appropriate and useful subjects to talk over on such an occasion, and they were listened to by the practical men present with much attention."

We ventured to say, when first the announcement of this year's gathering reached us, that if it was really desired to have agriculture well represented, nothing could be worse chosen than the day determined on. We heard this everywhere repeated at the Carlisle Show; while we find it too palpably corroborated in the actual result. We have waded through a long list of "the company present," as given in the local journals, to find only some three or four names of any distinction as agriculturists. Happily one of these did rush in to the rescue, or we might have travelled through columns more of oratory with quite as little "appropriate to the occasion." It is almost difficult, after all, to say what this is. Is it farming, and nothing but farming? or, is that hobby but the stalking-horse for something further? Let us not only consider what has come, but what may.

Let us picture Mr. Mechi as he described himself at this last meeting: "When first I walked over this farm with my friend Mr. Deane one wet 25th of September—it was a wet day, and it was a miserable farm. On one side, which was called light land, we sunk into a loose pulpy sand; and the heavy side was like bird-lime: so the more we walked, the more we got wet." There we see him on the barren heath, like a second Macbeth, defying the fury of the elements; and here, too, the weird sisters must surely have risen before him, presaging all his future greatness:

"Hail! Mechi, Squire of Tiptree!" is the greeting of the first, with a really northern accent. Could it have been a spirit from Baldoon?

"All hail! Mechi, Member for Maldon!" promises him the second, with a far more local twang.

And then the clouds clear, and the *Moon rises;* and a well-fed witch, with all the dignity of "post prandial platitudes, and an utter disregard of Lindley Murray," thus puts the crowning honour on him:—

"All hail!" Mechi, Lord Mayor as is to be!"

At present the agricultural gathering is simply a lucus a non lucendo, so called because there are few agriculturists present. Let it be strictly scientific, parliamentary, municipal, or whatever you please; but let us know what we are doing, and call things by their right names. We are quite willing to regard Tiptree Farm merely as a hobby; if it is really meant for something more, let us have better proof of it. Sheridan has a classification of puffs. Is this the puff direct, or only by implication for something hardly yet revealed?

THE NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

MEETING AT BOSTON, AUGUST 23.

When we come to consider how frequently and how honourably the farming of this county is referred to at our different agricultural gatherings, it would seem strange indeed if Lincolnshire had not some such especial exponent of its own. The heading of this report will show it has such a one; though this is now but *one*. During the some twenty years the North Lincolnshire Society has been established, many institutions of a somewhat similar character have fallen in. It has thus come to pass that the North Lincolnshire has something more than a district duty. Sir John Trollope, indeed, at the dinner on Thursday last, made this the chief point in a very good speech. The honourable member had no wish to be considered only as a mere visitor; but strongly advised that the "North" should be dropped, and the Society become at once what it is fast approaching to—the united association of the whole county.

It is satisfactory to say that those Sir John was addressing went entirely with him. For our own part, we can only repeat that it is a course we have long continued to recommend. Small, confined local meetings end commonly in very small results. The whole strength of a county, however, and of such a county as this, must always carry a weight and importance with it, that it would be vain to attempt by any less general means. As it is, in making that round of visits it annually pays to different districts, the "North Lincolnshire" has already extended its course of action beyond the North proper. As long, then, as other societies continued to exist, there might have been some hesitation as to crossing the Witham; but there can, or should be, none now. As one yearly meeting of the whole county, the Lincolnshire may soon become as successful a show as that of its immediate neighbour in Yorkshire. The one, it is true, has its divisions, as the other its ridings; but on an occasion like this, a focus of strength should be the very first of objects.

There is, too, perhaps no county which contains within itself so many of the essentials for a good agricultural exhibition as Lincolnshire. In cattle it is deservedly famous all the world over; for horses, both for the collar and the saddle, it stands almost equally high; while in long-woolled sheep it can turn to many a breeder of established repute. This is something; but even this is not all. An agricultural meeting that is confined to a show of live stock is at best but half a meeting. Lincolnshire is quite as well prepared with the other half. In addition to many other rising firms, it can boast already of three of the most successful agricultural implement manufactories in the kingdom—the Hornsbys, at Grantham; Clayton and Shuttleworth, at Lincoln; and the Tuxfords, at Boston. A Lincolnshire show, then, ought to be worth looking at.

It is only fair to say it really is so. Without being all that it yet may become, the gathering at Boston, on Thursday, was a very good one. The county was well represented. Short-horns, cart horses, hunters, and Leicesters were not only generally strong, but in

some particular examples very remarkable for their excellence. Take, for instance, the four prize shorthorn cows, shown together as "the property of one person;" and never, perhaps, were there four better cows selected from one herd. In all the recommendations of size, quality, and symmetry, they were alike to be distinguished. They were deservedly the chief object of attraction, while it was gratifying to find that "the one person" who claims them is so active a member of the society as Mr. William Torr. Mr. Banks Stanhope, who gave the premium for this collection, had himself an entry of four well-bred, good-looking animals; but, as he confessed, he had no idea when he sent them that he was to compete against such an entry as that from Aylesby.

The first prize-bull, again, Mr. Dudding's "The Squire," is a very fine beast, combining great size with very high quality—this, indeed, may be more or less assured, as he comes from Mr. Towneley's stock, and is only freshly imported into Lincolnshire, where he should afford a very serviceable cross. Mr. Torr, Mr. Stanhope, and Messrs. Dudding and Thorpe had also some promising young bulls; and Mr. Cooper, of Swineshead, a couple of good useful cows, which took the first and second prizes in their class. It was only when compared with Mr. Torr's lot that it became in every way two to one against them.

Taken as a whole, however, the show of sheep was more uniformly good than that of cattle. It was composed entirely of Leicesters and other longwools, and chiefly to be remembered for the capital entries in every class of the rams. The ewes were by no means so numerous. Nearly all the best breeders of the county contributed towards the former—Messrs. Abraham and Charles Clarke with a very marked superiority over their fellows. With so fine a show of sheep, it was only to be regretted that they were not displayed to better advantage. A ram properly should have a pen to himself, or, if four or five must be put together, surely more room should be allowed than was allotted to them at Boston.

A very uneven show of pigs was chiefly noticeable for the difficulty the judges had in distinguishing between what were "large" and what "small" breeds. We can quite understand their dilemma.

The horse premiums, thanks to some extra classes, ran through almost every sort and age, from the thorough-bred stallion to get hunters, hunting mares, colts, and foals—to weight-carrying hacks, and so on to stallions, mares, and their produce best adapted for draught purposes. The entries were not so numerous as might have been expected; still but few of those shown but did credit to the county. Two or three of the hunting mares, Mr. Heneage's couple of three-year-olds, and the hack mare to carry eighteen stone, may be selected from the riding classes. The hack mare was remarkable not only for the power she possessed, but yet more so for the way she could use it. Her hind leg action was really capital. There was a grey hack again, that many would covet, though hardly up to the eighteen stone. Surely this, as a rule, is little too high a range. When a man gets so far, he is fit for little but rail or water carriage.

The prize for thorough-bred stallions went to Humphrey, now twenty years old, a fairish race-horse in his time, while he has worn remarkably well since. Had the brown horse Martext been as fresh on his legs, it is a question whether for getting hunters he would not have stood first. Rat-trap was entered, but not shown. There was some promising young stock by him, however, in the yard, to one of which the foal prize was awarded.

The draught horses, both in number and merit, were, however, superior to the other class of stallions. The prize horse is a very fine, almost showy, animal, with a capital forehand, and a very good mover. The point was between him and another England's Glory, the more compact horse of the two, but not of so fine a frame, or so good in action. They were still both superior animals, and there were others in the class quite worthy to show with them. The draught mares, though less uniform in excellence, gave further evidence of how well Lincolnshire is supplied in this way; but further corroborated by the pairs of cart-horses. The prize for these had not been awarded when we saw them, nor have we since been able to insert it in our list; but we should fancy it must have gone to Mr. Godson and his black roans.

We cannot, indeed, be altogether answerable for this prize-list. Some of the awards in the implement department had not been declared when we left on Friday; and no report has since reached us. The great feature in this—the implement section of the show was the trial of the steam engines; the success of the Messrs. Tuxford at Carlisle giving an additional interest to the strong display they made here, on their own ground. They were, however, successfully opposed on this occasion by the neighbouring firm of Hornsby, from Grantham; the judges declaring, after two very long trials of the several engines, against the Royal Agricultural Society's award. We have not yet learned the precise reasons for this, but it is stated the consumption of coal by the Boston engine was greater than in the extraordinary performance at Carlisle. To have made this test more satisfactory, it would have been desirable to have had the second prize from the great national meeting also at work. Considering, too, that Messrs. Clayton and Shuttleworth's is a Lincolnshire firm, we must say it struck us as something extraordinary not to find them exhibitors at a Lincolnshire Show.

The prize-list, arranged alphabetically from the catalogue, will speak, on the other hand, to the presence of many well-known makers, such as Busby from Bedale, Garner from Spalding, Greening from Manchester, Smith and Ashby from Stamford, Simpson from Lincoln, and others. Might we suggest that it would be better to arrange, at least in some degree, a prize-list for implements, instead of leaving it altogether to the judges, as at present? Manufacturers would then know what was wanted, or what they were invited to enter for. The amount of premiums, too, is very insignificant. A few of a few pounds each would surely answer better

than crowns and half-sovereigns. The one grand premium of £20 given by Lord Yarborough and Mr. Hamilton (late Mr. Christopher) M.P. for the best agricultural implement, would go, we should suppose, to Messrs. Hornsby for their steam engine, but we have not yet had this on authority.

The prize-list was certainly to a partial extent read over at the dinner, although with very questionable advantage. Commencing with servants and labourers, the conditions in which were necessarily of some length, it went on to prizes for stock, including those for cocks and hens, every class of which were carefully proclaimed. Next it proceeded to the implements, as far as the awards had been declared; and then the labourers were called in to receive their rewards and drink the health of the chairman. Excellent as all this is, a great deal of it may be omitted in the proceedings at the dinner. The effect here, in fact, was very similar to that of reading the riot-act; it went a long way towards dispersing the company. This at starting was a very numerous one, the new Corn Exchange, which was opened for the occasion, being quite filled. In the lamented absence of the president, Lord Yarborough, Mr. W. Garfitt, jun., undertook the duties of chairman. He went through them with much tact and ability, having the support of three members for the county—Mr. R. C. N. Hamilton, better known as Mr. Christopher, Mr. Banks Stanhope, and Sir John Trollope. The other speakers included Sir Charles Anderson, Sir Henry Dymock, Mr. S. Skipworth, as high sheriff for the county, Mr. Torr, Mr. Iles, as one of the judges, Mr. Greetham, for the successful candidates, and the Mayor, in returning thanks for the compliment so deservedly paid to the town of Boston.

To Sir John Trollope's speech we have already referred. Mr. Hamilton, who preceded him, declared his conviction that the harvest would be by no means so good a one as people had been led to suppose. He further informed the meeting that the Great Northern Railway had refused the Society their usual courtesy in the transmission of stock—a determination that promises to make this Company exceedingly unpopular in the county. Landowners and occupiers appear alike inclined to remember it hereafter. The high sheriff, though certainly, as he admitted, "no orator," stuck very gamely to his point on the culture of the turnip crop; while Mr. Torr gave "The Labouring Classes" with much emphasis and sympathy. He characterized those in Lincolnshire "as better cared for than any in England." Mr. Banks Stanhope, as a bachelor, gave "The Ladies" for the concluding toast, and in doing so referred very happily to the great baby show which was celebrated on this same day in the good town of Boston. It brought, we are told, a very strong entry; the classes running on from those in arms up to two and three-year-olds, both for colts and fillies. Its grand object, in filling some tea-gardens in the neighbourhood, may be said to have been quite successful; beyond this, we do not see that it adds much to the credit or *éclat* of an agricultural meeting.

CATTLE.

JUDGES.—W. Bartholomew, Goltho, Wragby.
Thos. Mason, Little Thornton, Gargrave, Yorks.
Charles Rundell, Evesham, Worcestershire.

SHORT-HORNS.

For the best bull above one year old, the prize of 20*l.* to Richard Dudding, of Panton.

For the best bull three years old or upwards, the first prize of 5*l.* to William Torr, of Aylesby; second of 3*l.* to William Hutton, of Gate Burton.

For the best two-year-old bull, the prize of 5*l.* to J. B. Stanhope, M.P., of Revesby Abbey.

For the best yearling bull, the first prize of 5*l.* to Messrs. Dudding and Thorpe, of Otby; the second of 3*l.* to William Hutton.

For the best bull calf under a year old, the first prize of 3*l.* to Wm. Torr; second of 1*l.* to John Kirkham, of Hagnaby.

For the best cow more than four years old, having produced a calf at its natural time, within nine calendar months of the time of showing, the first prize of 5*l.* and second of 3*l.* both to John Cooper, of Swineshead.

For the best heifer three years old, having produced a calf at its natural time, within nine calendar months of the time of showing, first prize of 5*l.* to Henry Munk, Algarkirk; second of 3*l.* to J. B. Stanhope, M.P.

For the best two-year-old heifer, first prize of 5*l.* to Thomas Greetham, Stamfield; second of 3*l.* to J. R. Kirkham, of Hagnaby.

For the best one-year-old heifer, first prize of 5*l.* to T. C. Maidens, of Brinkhill; second of 3*l.* to Chas. Bramley, of Sibsey.

For the best she calf under one year old, first prize of 3*l.* to William Hutton; second of 1*l.* to John Cooper.

For the best four breeding cows, the property of one person, or partners, not entered in any other class, the prize of £5, given by J. B. Stanhope, Esq., M.P., to William Torr.

SHEEP.

JUDGES.—William Sanday, Holme Pierrepont, Notts.
Robert Dennis, Greetham, Horncastle.
J. S. Walesby, Ranby, Wragby.

For the best ram of any age, the prize of 10*l.* to Charles Clarke, of Scopwick.

For the best shearling ram, first prize of 7*l.* and second of £3 to William Abraham, of Barnetby-le-Wold.

For the best two-shear ram, first prize of 5*l.* and second of £3 to William Abraham.

For the best aged ram, first prize of 5*l.* to Charles Clarke; second of 3*l.* to Thomas Mayfield, of Dwydyke.

For the best pen of ten ewes, having suckled lambs up to the 10th July, first prize of 5*l.* to J. Kirkham, of Hagnaby; second of 3*l.* to R. W. Holmes, of Fiskerton.

For the best pen of ten shearling gimmers, first prize of 5*l.* to W. Abraham; second of 3*l.* to C. Clarke.

For the best pen of ten she lambs, a prize of 1*l.* to Fountain and Blenkarn, of Leake.

HORSES.

JUDGES.—Wm. Uppleby, Bonby, Barton.
Jno. Skipworth, Housham, Kirton Lindsey.
Edmund Davy, Hagnaby, Alford.

For the best stallion for hunters, the prize of 10*l.* to John Ashton, of Wragby, for Humphrey by Sandbeck.

For the best stallion for draught horses, the prize of 10*l.* to John Hutchinson, of Weston, for England's Glory.

For the best mare for breeding hunters, with a foal at her heels, or having been put to the horse in the season of 1855, first prize of 7*l.* to Thomas Lyall, of Gayton Manor; second of 3*l.* to Francis Smith, of High Toynton.

For the best mare for breeding draught horses, first prize of 7*l.* to Joseph Godson, of Heckington; second of 3*l.* to Charles Smith, of Frampton.

For the best cart filly, two years old, the prize of 5*l.* to Joseph Dawson, of Thornton-le-Fen.

For the best cart filly, one year old, no entry.

For the best cart foal, the prize of 2*l.* to Joseph Cook, of Boston.

For the best hunting gelding or filly, three years old, by a

thorough-bred horse, a whip, value £5, to G. F. Heneage, M.P., for a bay gelding, by The Brownie.

For the gelding or mare best calculated to carry 18 stone, as a hack, and not exceeding 15 hands in height, a silver cup, value £5, given by Sir Edward Brackenbury, to Henry Munk, for a brown mare.

For the best hunting foal, by a thorough-bred horse, the prize of £5, given by G. F. Heneage, Esq., M.P., to a colt by Rat-Trap.

PIGS.

JUDGES.—The same as for sheep.

For the best boar, large breed, the first prize of 4*l.* to the Rev. Basil Beridge, of Algakirk.—No second awarded.

For the best boar, small breed, first prize of 4*l.* to William Torr; second of 2*l.* to John Harrison, jun., of Heaton Norris.

For the best sow, large breed, having had a litter since last March, 1855, first prize of 4*l.* to John Harrison, jun.; second of 2*l.* to Francis Jones, of Boston.

For the best sow, small breed, prize of 4*l.* to T. M. Keyworth, of Lincoln.

For the best three breeding pigs of the same litter, not exceeding six months old, large breed, prize of 2*l.* to William Allatt, of Glinton.

For the best three pigs, small breed, prize of 2*l.* to William Allatt.

LONGWOOL.

JUDGE.—T. Clayton, Ripley.

For the best five fleeces of the wool of hogget sheep, first prize of 3*l.* to William Abraham; second of 1*l.* to John West, of Melton Ross.

For the best five fleeces of the wool of ewe or wether sheep, first prize of 3*l.* to William Abraham; second of 1*l.* to John Kirkham, of Hagnaby.

IMPLEMENT AWARDS.

JUDGES—Thomas Brooks, Croxby, Caistor.
J. C. Symonds, Fishtoft, Boston.
John Iles, Binbrook, Rasen.

CONSULTING ENGINEER.—C. J. Carr, Belper.

To Thomas Ashley, Louth, for a self-cleansing clod crusher, 10s.; and for a cake breaker and bean splitter, 10s.

To William Bradshaw, Boston, for a corn dressing machine, 10s.

To W. Busby, Newton-le-Willows, near Bedale, for a two-horse waggon, £1; for a general purpose plough, 10s.; for a swing plough, 10s.; and for a paring plough, 10s.

To James Clarke, Lincoln, for a dressing machine, 10s.; and for a barley horner, 5s.

To Wm. Coulson, York, for a combined, boring, mortising, tenoning, and drilling machine, £1.

To Wm. Garner, Spalding, for a clod crusher, 10s.; for scrapers, extra, 5s.; for a cake breaker for sheep or beasts, 5s.; for a turnip cutter, single action, 10s.; for a horse rake, 10s.; and for iron seed harrows, 10s.

To Charles Grantham, Fulstow, for a dressing and blowing machine, combined, 10s.

To Thomas Graves, Old Bolingbroke, for Swing and Wheel Ploughs, 10s. for the stand.

To Benjamin Greening and Co., Manchester, for portable wire fencing, 10s.; and for a wrought iron gate, 10s.

To Selby Hand, Glinton, Cambridge, for a roll with scrapers, 15s.; and for a chaff cutter, £1.

To James Hayes, Elton, near Oundle, for a grinding mill, £1.

To Hornsby and Son, Grantham, the prize for an eight-horse portable steam engine; for a drill for general purposes, £5; extra for carriage steerage for corn and seed drill, £2; for a corn dressing machine, 10s.; and for a cake breaker, 5s.

To G. Hunter, Ulceby, for a corn and small seed drill, £1.

To J. Kemp, Thurlby Grange, for a liquid manure ridge drill for the flat £1.

To Lucas and Wright, Lincoln, for a barley horner, 10s.; and for a churn, 5s.

To Thomas Luck, Spalding Common, for a dressing machine, with elevators and weighing machine combined, £1; and for a horse rake, 10s.

To Thomas Lyall, Gayton Manor, for a light iron beam plough, £1.

To James Martin, Wainfleet, for a four-horse iron drag, 10s.

To Robert Mason, Alford, for a weighing machine, with sackholder, for weighing sheep alive, 10s.; and £1 for the stand.

To Charles Revill, Lincoln, for a dressing machine, 10s.

To John Robinson, Wainfleet, for a horse hoe for corn and turnips, £1.

To W. Sawney, Beverley, for a winnowing, blowing, and hariff machine, 10s.

To Ann Simpson and Son, Lincoln, for a three-horse power steam engine, £2; for a set of steam cooking apparatus, 10s.; for a clod crusher, 10s.; for a blowing machine, 10s.; for a pulping machine, 10s.; for a turnip grubber, 10s.; and £2 for the stand.

To E. Skins, Metheringham, for the Blankney gauge harrow, 5s.

To John Smith, Heighington, for a set of light seed harrows, 10s.; and for a set of three harrows for two horses, 10s.

To Smith and Ashby, Stamford, for a self-cleaning eccentric clod crusher, with travelling wheels, 10s.; for a haymaking machine, 10s.; for a horse rake, 5s.; for a safety chaff cutter, for horse or hand power, 10s.; and for a horse power gear work, £1.

To William Thimbleby, Louth, for a presser and pulverizer, 10s.

To Tuxford and Sons, Boston, for a combined thrashing and winnowing machine, £2; and for a circular-saw table, small size, 10s.

To Thomas Walker, Wootton, for a corn and turnip drill, 10s.; and for a stand of harrows, 10s.

To White and Harris, Sleaford, for a plough with metal breast, 10s.

SOWING THICK AND THIN.

SIR,—Since turning our attention to the growth of corn, though but tyros in this branch of agriculture, careful investigation has proved to us, that from an extravagant full plant of from two bushels per acre of wheat, or three bushels per acre of barley and oats, some of the seeds do, and must by reason of its extreme thickness, and as a necessary consequence, fail to produce any ears, or ear at all, and only 1, 2, and 3 diminutive ears are or can be possibly obtained from each grain, averaging only about two abortive or puny ears, and containing in *both not* 30 perfect grains: (a strange contrast between this and 4,000 to 8,000!). This need not cause great astonishment nor disbelief, and we speak it without fear of contradiction; for were it so, 60 bushels per acre produce of wheat and 90 bushels per acre of barley and oats would, of course, consequently be often realized, viz., thirty times as much as was sown, which at first sight appears but little, and in effect it really is; but where is even this insignificant produce obtained from such proceedings? A correspondent on whom we can rely for truth, writes us from Inverness:—"The practice of thin sowing has not come this way yet, grain being generally sown about *six* bushels to the acre!" How is this inadvertence to be accounted for? can it be in the difference of a Scotch acre, or the Scotch bushel? Whilst we contend that our growing crops from only 6 to 8 pints per statute acre, with some 20 to 80 fine ears protruding from each grain or root, hang dangling and wafting majestically in the summer's breeze, as noble examples for larger establishments, and which cannot be beaten by anybody else's, or anywhere, except from a smaller quantity of seed even than this? A great mistake rests *some*where; *but* where? We pause for reply: not that we are ignorant of it ourselves, for we know it full well from repeated practical experience, and wish others to understand it also, for their own and the nation's weal.

We are, Sir, yours truly,

HARDY AND SON,

Maldon, Essex, July 6th, 1855. Seed-growers.

KENNINGTON AGRICULTURAL AND CHEMICAL COLLEGE.

LECTURES ON THE GENERAL PHENOMENA OF THE EARTH, HAVING REFERENCE TO THE PRODUCTION AND MAINTENANCE OF ORGANIC LIFE.

BY CHARLES JOHNSON, ESQ., PROFESSOR OF BOTANY, GUY'S HOSPITAL.

LECTURE V.

The wearing action of water in motion is not the only means by which the substance of the rocks becomes abraded and broken up, under the influence of that all-important and widely-distributed fluid. In tracing the river from its source, in the commencement of the last lecture, speaking of the rushing force of the parent torrents and the effects resulting from their downward flow, in sweeping away and depositing the ruins of the mountain to the elevation of the valley and the plain, the loosening action of frost has been already alluded to, as well as the fall of rain and snow, and the deposition of dew, as inseparable from river origin and history. These phenomena, intimately associated in various other instances with the organic creation, belong to a class of circumstances we have yet to examine. Hitherto we have only regarded our earth as a sphere consisting of land and water, subject to reiterated changes of surface through the immediate mechanical action of the latter upon the former. We have now to consider the conditions existing around that surface, and their separate effects in those modifications that are the subjects of our inquiry; such conditions resulting or being themselves modified through the influence of a third proximate element of the globe—its atmosphere.

Enveloping this diversified abode of ours, and extending to an unknown distance around it, as it rolls through space—a diffused mass of matter, invisible but tangible, and fulfilling functions without which no known organization could be maintained—the air is a mighty mechanical and chemical agent in its general economy. Atmospheric influences, in the aggregate, are at present imperfectly understood; in many points, rather acknowledged and speculated upon as existing, than capable of being explained to our satisfaction. But, as we are now only bent upon tracing the association of known phenomena, as contributing to a certain end, we need not here seek to investigate those that are only problematical.

Held around the earth by the same attractive force which regulates the disposal of its denser elements, and constituting a portion of its collective substance equally subservient to the laws of gravitation as are the land and water, the atmosphere accompanies it through all its movements without liability of separation, and, as a part of the same revolving mass must have a defined limit, which is generally estimated to be from forty to fifty miles above us, resting upon the solid and fluid surface, it presses upon this with a certain force constituting its weight, and being itself compressible, its lower layers are denser than its upper—so much so that by far the larger quantity of its material may be regarded as existing within a very few miles of the earth's surface; indeed, according to a mean computation, three-fourths of the whole substance of the atmosphere is contained within the compass of an elevation of about four miles only, the remainder of its estimated extent becoming gradually rarer or thinner until its presence is no longer appreciable by any means of observation or calculation that we possess. The average force of atmospheric pressure at the level of the sea is fifteen pounds upon every square inch of surface, and it decreases according to a regular ratio as we ascend from this plane—a circumstance demonstrated by comparison of the height to which a column of water is capable of being raised by the action of the pump, or the column of mercury kept up in the tube of the barometer, as well as by the greater or lesser heat required to boil water at different elevations; all of which phenomena, duly observed, afford a clue to the determination of distances above the sea-level. Thus the mean height of the barometer in London, on the shores of the Thames, is, in round numbers, thirty inches, while at an elevation of three miles it is about fifteen inches, and at one of six miles would be reduced to seven inches and a-half only; and water, the boiling point of which is averaged at a temperature of 212 degrees on Fahrenheit's scale on our low lands, would be brought to that point on the summit of Kunchinchinga, 28,178 feet above the sea, by a degree of heat under 161, in consequence of the decrease of pressure upon its surface at an elevation of nearly five miles and a quarter. Local variations of this pressure occur irregularly from time to time, owing to causes yet unascertained; and periodical changes are likewise indicated by our instruments, dependent upon the influence of the sun. Whether such changes are accompanied by or consequent upon tidal fluctuations of this expansive and readily-disturbed medium, acted upon by solar, lunar, or planetary attraction, as many have supposed, is a point undeterminate in our existing state of knowledge, though analogy with the tides of the ocean, produced through the agency of our attendant planet, tends to render such a circumstance probable.

The action of the atmosphere is of an exceedingly complicated character, and, owing to the almost certainly ascertained absence of such a medium around the moon and some of the primary planets of our system, they have been deemed incapable of supporting animal or vegetable beings. The necessity of its presence to the immediate maintenance of earthly life, as constituting the breath upon which its continuance depends, the weight that binds the fluids to the surface, by acting as a check to their evaporation, are only items in the vast account of our terrestrial being that we owe to this unseen covering. The diffusion of the necessary heat and light and moisture over the globe are dependent upon it, as well as their retetion; and these are circumstances involving a variety of others too numerous and too important to be summarily discussed. The effect of the sun's rays upon an earth devoid of atmosphere would be to communicate heat to those parts exposed to them; which would again pass off into space by radiation during his absence—a loss which, if not entirely prevented under present conditions, is at the least rendered slow in operation, in consequence of the capacity of the air for its retention. We are not yet acquainted with the exact action of those laws which regulate the radiation of heat through or from our atmosphere into space, or in what degree

that wonderful agency may be there distributed; but experience demonstrates that the temperature decreases as we ascend from the sea-level, and that this decrease is attendant upon, though not universally proportionate to, the increasing tenuity or rarity of the air. Hence the intense cold that prevails about the summits of all our higher mountains, where the snows rest unmelted under the unclouded summer sun, and oppose the development of organic structure unless in its most simple and least enduring forms: a circumstance productive of a vast amount of local amelioration of climate, especially in the intertropical regions of the earth, as well as instrumental in maintaining many of those inland water movements that we have already observed upon.

The rarity of the upper regions of the atmosphere is a condition arising partly from its elasticity, partly from its tendency as a gaseous body to expand by the farther separation of its atoms under the influence of heat; while their coldness may be regarded as a necessary result of the inactivity of the principle thus absorbed—inactive at least, or latent, as regards those manifestation by which alone we are capable of recognizing its presence. This elasticity and apparently indefinite or unlimited expansive property renders all aëriform bodies indifferent conductors of heat, and hence arises the obstacle to its continued radiation from the surface of the earth into space through a medium of this nature.

Consisting chiefly of two gases mingled in very unequal proportions—whether chemically or mechanically is yet uncertain—the air we breathe is capable of receiving and combining with other gases and exhaling substances, and is never devoid, even in the most elevated regions hitherto reached by man, of a large proportion of watery vapour; indeed, the affinity, the tendency of the two life-supporting fluids air and water to unite, is among the most important of the natural phenomena by which we are here encircled. It is thus that their mutual action becomes subservient to organic development; the water we drink, the air that we inhale, are mutual solvents of each other, and without this combination of proximate elements the world would be a desert. But we must not wander from our present subject of discourse—the union of water with the atmosphere. Elevated by the action of heat, aided probably by the affinity in question, the vapour rises, and, as it rises, expands—it mingles with the air, it becomes essentially a part of our atmosphere. Is the mixture a mechanical one only? Its limits are not ascertained. The chemical doctrine of equivalents does not explain them, and yet the vapour seems to have lost its property as exhaled water; that fluid, converted into vapour within a confined space, is condensed and again becomes water when it arrives in contact with a cooler body. And why not now? What law acts to retain it in the gaseous state? even ice and snow disappear more or less quickly with the thermometer at zero. We have really no plausible, far less any satisfactory explanation of a phenomenon upon which some of the most essential conditions of the earth's history are dependent. And yet, after all, this vapour does return to its original fluid state when the necessary agency comes into play: it is showered upon the land as rain and hail and snow; it is dropped insensibly as dew, to cap the mountain; to fill and overflow the channel of the river; to moisten the parched soil; to swell the contracted tissue of the growing plant, in order to prepare the never-ending supplies of vegetable food, so necessary to yield, directly or indirectly, all that is required to satisfy the complicated wants of animal life, from the lowest to the most elaborate and endowed forms of instinct and reason.

The same primary cause that vaporizes the ice and snow, retains the vapour distributed in the rare elevated regions to which it has ascended; but a change occurs, of which the effect is manifest though not the source. We are looking upward into a summer sky of intense spotless blue: a greyish hue seems to steal over the part immediately above our heads; the previously clear hue of the zenith becomes dimmed; the greyness spreads and deepens; a faint smoke-like haze obscures the whole canopy of the heavens; the cloud is forming; it becomes darker and darker, and a few drops of rain descend. Whence is the revolution? Perhaps a current of air, miles above the level upon which we are standing, loaded with moisture, and chilled as it has swept the snow-capped summits of some distant range of mountains, has abstracted a portion of the latent heat of the previously-invisible vapour with which it has come into contact above us. The weather has an ominous aspect; but the rain does not fall, beyond the few auguring drops: the cold, high current has communicated its motion to the strata of air beneath, and the increasing and lowering scud drifts onward with accumulating speed, while the summer heat becomes exchanged for an autumnal chill.

The atmosphere is a medium of mysterious, because of yet undiscovered agency; and as many unseen influences probably operate through its ever fluctuating and variously-disturbed regions as there are at work in the unpenetrated depths of the planet it surrounds. The fall of water as rain, hail, snow, and dew, though these are mutually the result of condensation through the loss of heat, is otherwise dependent upon very different conditions. We have watched the formation of cloud in a clear sky, and we have ventured to speculate upon its origin; but of the cloud itself, or rather of the nature of it when formed, there is some difference of opinion, as well as concerning the elevation at which it may possibly exist. That its substance is modified vapour, is universally allowed; but in what state, is questionable. Some have supposed it vesicular, or consisting of inconceivably minute globules of water, filled with air; others regard it as composed of crystalline snowy or icy particles, so loosely aggregated as to float upon the denser air of the lower atmosphere: and both of these theories, if such we are justified in terming them, may not be very wide of fact, under the varied aspect it assumes. In summer, we walk through the mist of the valley, and its moisture feels cold and penetrating: after an ascent of an hour, we pass into the cloud that we have perhaps from afar seen high above the mist, hanging on the mountain's side, and the sensation is the same. The mist seems a fallen cloud, the cloud an elevated mist. In winter, under the action of frost, the dew-like drops of the summer cloud are exchanged for minute spiculæ, that settle upon hair and clothing. The condition of a cloud seems, like that of the water composing it, to be regulated by the temperature of the region in which it exists; and the dense cumulous masses that, reflecting the light of the sun so as to appear at one time as if composed of burnished silver, and at another like mountains of pure white marble or newly-fallen snow, may, at an elevation of little more than a mile, be really in the latter state. The vapour, condensed into cloud, acquires increase of weight or specific gravity, and sinks through the atmosphere, until it reaches a stratum of air sufficiently buoyant to resist its further descent; and hence it occurs that clouds of varied form and character are seen at the same time at different elevations, the heavy, compact, and rounded cumulus occupying the lower station, the diffused and streak-like cirrus the higher.

The fall of rain in quantity, or continuously, seldom occurs from a single stratum of clouds; and it is always preceded by alterations in their aspect and disposition, especially by their margins losing that distinctness of outline that contributes so

much to the beauty of the landscape in summer, as they float over the deep azure of the clear sky above them. In referring to the forms of clouds, I have employed the terms generally adopted by meteorologists, as *cumulus, cirrus,* &c.; but in tracing these modifications of watery vapour, in connexion with its return to the earth's surface in a fluid state, it is necessary that you should be acquainted with the circumstances attending such modifications, and have at the same time a definite idea of their classification. The value of this latter need not be expatiated upon, to those who have already made some progress in the investigation of the diversified forms of the animal and vegetable kingdoms, in relation to which arrangement is so necessary—nay, so indispensable. It might appear, it is true, that, there being so little analogy between the positive and essential forms of organic bodies, and the chance-disposed outlines and condensing vapour drawn or wafted hither and thither, and yielding to the slightest impulsive force, the study of cloud-forms was an idle, or, at the least, a very fanciful and useless one; but the student of nature must never lose the recollection that every existing substance, form, appearance, and effect around him, is the result of laws and agencies that, although impenetrable and inappreciable by our present comprehension, are consistent in their action; and that things the most transient and apparently uncertain are really equally amenable to rule, and as completely decided in their operation, as the most stubborn and the most invariable of terrestrial forms. He must bear in mind that "the power which erring men call chance" does not exist, unless in the fancy of the ignorant and incapable.

Mr. Luke Howard, some half-century past, called attention to cloud-structure and aggregation, and to the possibility of rendering its observation subservient to purposes of science and general economy, by publishing a classification of their forms and a theory of their formation; and his arrangement has one advantage over many such in other departments of natural history, inasmuch as its basis is simple, and the nomenclature short and easily retained by the memory. He prefaced its introduction by remarking that the principal modifications of cloud are commonly as distinguishable from each other as a tree from a hill, or the latter from a lake, although clouds in the same modification, considered with respect to each other, have only the common resemblances which exist amongst trees, hills, or lakes, taken generally. This is a fact too obvious to need any comment, and upon it are founded three primary divisions or types of cloud-form, which, commencing with the earliest or first definite result of visible condensation, are thus entitled and defined:

1. CIRRUS.—Including those consisting of parallel, curved or diverging fibre or thread-like streaks, extending in various directions, often resembling a lock of hair or a feather.

2. CUMULUS.—Convex or rounded heaps, having a more or less dense or solid appearance, and tending to increase upwards; these are the clouds that present such picturesque diversities of outline, resembling mountains, ruins, &c., especially when accumulated about the horizon.

3. STRATUS.—Any widely extended, continuous, horizontal, or level sheet of cloud, tending to increase from beneath, including mist and fog.

Either of these forms, upon any change taking place in the circumstances attendant upon its production, is liable to pass by insensible gradations into another, or it may continue a considerable time in an intermediate state, partaking of the characters of two of them; and it may disappear in this stage, or return to the first modification. Again, clouds separately formed in different states may unite and pass into one, exhibiting different characters in different parts; or, a portion of one cloud sometimes passes into another modification without separating from the remainder of the mass. To express these diversities of the simpler and more positive types, Mr. Howard employed three other terms, compounded from the three primary ones, viz.:—

4. CIRRO-CUMULUS.—A collection of small roundish clouds, more or less well-defined in outline, and arranged in close order or contact. This modification is the transitional grade between the two types that give it name.

5. CIRRO-STRATUS.—Horizontal or slightly inclined masses of cloud, narrowing towards the extremities, and concave or often undulated beneath. Groups of small clouds having this general character are not unfrequent toward the end of summer, and constitute what is vulgarly called a "mackerel sky."

6. CUMULO-STRATUS.—A dense cloud, in which the form of the cumulus is mingled with that of the cirro-cumulus or cirro-stratus.

To these six primary and intermediate forms may be added that from which rain falls:—

7. NIMBUS.—The rain cloud, spreading out above into a crown of cirri, and passing beneath and laterally into the cumulus or stratus. It is a form of cloud exhibited during the falling of a summer shower, or covering the face of the heavens during continuous rain.

Of all these modifications of cloud, the cirrus occupies the greatest elevation, and it is the earliest that appears after a succession of clear weather, indicating a tendency to change; in such case, it is usually ushered in by the appearance of a few thread-like lines pencilled, as it were, upon the sky; these increase in length, and new ones are added laterally, the first formed often attracting the others so as to produce the bristly mass called the "mare's tail," so frequently referred to by the expectant farmer as a prognostic of approaching rain. Cirri of this character are, however, rather indicative of a high aërial current that may eventually lead to the precipitation required than symptomatic of its near advance; indeed, the appearance of long streaks of cirrus, reddened by the setting sun, has been long regarded as significant of wind.

The cumulus may be formed by the descent of the cirrus into the lower regions of the atmosphere, or it may originate in those regions without undergoing that transition; in the first case, the intermediate form of the cirro-cumulus precedes its production, and sometimes the transformation proceeds no farther, evincing that the tendency to condensation is slow, and its ultimate effect uncertain; hence, when the latter is the prevailing form of cloud, the continuance of fair weather during the following day or two may be generally anticipated.

The stratus is a form occupying the lowest position of all the clouds; its inferior surface frequently resting immediately upon the earth, in its condition of mist or fog. As such, its production takes place in consequence of the reduction of temperature towards sunset, when the heat evolved by radiation is insufficient to maintain that diffused state of the vapour necessary to its transparency. Viewed from above, as it rests upon the lower lands, the upper surface of the mist presents a level, which, as the sun rises, becomes raised in rounded masses as the whole begins to separate from the ground, more or less slowly ascending, and either dissipating or passing into light cumuli. Owing to the moist state of the air in the autumn, mists of this kind are more frequent towards the close of the year than at other seasons, and are generally regarded as the precursors of fair and mild weather.

The study of the various forms and vicissitudes of the clouds affords a wide scope for speculation upon the conditions to which they lead, and our ordinary prognostications upon the weather are influenced by observation of their varied

aspects; but, liable as they are to transformation or passage from one state to another, each prescribed type often failing before the eye that watches it, and undergoing rapidly the succession of changes that mark those of the invisible fluid that upholds it, it is only in association with other meteorological facts that these become important; and though, as the reservoirs of those necessary supplies of the fertilizing fluid, I have taken this hasty review of the structure and classification of clouds, owing to the necessarily contracted limits of the present course, it is not a subject upon which we can now expatiate farther: it is our object rather to generalize those phenomena connected with the maintenance of organic life, than to enter into the minutiæ of their history, and to examine them in all their bearings. The cloud alone would afford subject-matter for the course, rather than for the concluding paragraph of a lecture.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MEETING AT CARLISLE.

For the last time, at least as it is said, this is an "off" year with the Highland Agricultural Society. The meeting at Carlisle may thus be considered a joint exhibition of the two national associations. In some respects it has been so, but by no means to that extent which might fairly have been anticipated. It is only right to say that no blame rests with the management of that body under whose auspices the gathering took place. The Council of the English Society arranged distinct classes for Scotch cattle and sheep, and it only remained with our northern friends to enter for them. There was ample opportunity, if they only chose to avail themselves of it. This they did to only a limited degree. Many of the premiums offered entirely in compliment to them resulted in but little competition. With the cattle this was particularly the case; while with horses and sheep, on the other hand, we had some better evidence of what Scotland really could do.

If, however, this support was wanting in one way, it was by no means denied us in another. As far as a question of funds goes—"money taken at the doors"—the Carlisle meeting has been one of the most successful of all the Society's shows. The majority of these visitors, too, of course came from the North, and in crowds that weather, from first to last almost altogether unfavourable, appeared hardly in any way to affect. On Thursday, above all, they still continued to throng in, and gather round their own favourite sorts. The grey Clydesdale horse, the mountain sheep, and the prize Galloway, were but seldom accessible. And if the Southron had not paid his half-guinea on the day previous, he must have found it hard work to con over the merits of these champions of Scotland's agriculture.

Fortunately, there was plenty to attract his attention in other directions. As a stock show, that of Carlisle is altogether one of the very best the Royal Agricultural Society of England has ever been able to command. Following the usual course of the prize-sheet, we scarcely remember a class but that was worthily represented. From cattle to sheep, from sheep to horses, and so on to pigs of various sorts and sizes, and still we came on something very like general excellence. The prize list, to be sure, particularly in cattle and sheep, gave in names that alone assured us we should find the very best of their kind. More than this, however, those beaten were worth beating, and many an animal undistinguished here will live to see a better day. The reader has only to run his eye over the prize list to assure himself of the quality of the Carlisle Show.

Commencing with the first class in the catalogue, as now undoubtedly the most fashionable of all our breeds of cattle, we meet with a very extraordinary display of Short-horns. This, too, might have been expected. Yorkshire and Lancashire, despite the gradual distribution of the race, have still our best herds; and the houses of both York and Lancaster again did their best. Mr. Richard Booth—as we have just said, the name is a guarantee—took the first prize for the best bull, and again for the best cow; Mr. Towneley for the two best young bulls, as well as for the best heifer. After them we have a string of other good men dividing the other premiums and commendations amongst them—Lord Feversham, Mr. Ambler, Mr. Fawkes, Mr. Douglas, Mr. Stratton, and Mr. Sainsbury. The mention of these alone will show what there was to beat. The first prize bull is worthy of especial commendation, and this not only for his real merit in form and touch, his extraordinary length—that long, low, and even look, which argues so much for perfection of form—it is not only for this we would uphold him, but perhaps even more so for the condition in which, to borrow from another pursuit a most significant expression, "he wat brought to the post." Of all the bulls entered as Carlisle, Mr. Booth's white "Windsor" was not only the best for shape and symmetry, but he was the best fitted to breed from. Compared, indeed, with some of the over-fed animals which stood near him,

the superficial observer might wonder how he came to be placed first. It is, however, only the superficial that can be deceived in this way, while it is a very great fact to establish that a lean and really used bull did beat, on his innate merit, all that pampering and over-feeding could make up to show against him. As was well said by those who knew him best, "he was too good for that."

Lord Feversham's bull, which took the second prize here and the first at Paris, is one of Lord Ducie's highly-bred stock—a son of the Duke of Gloucester, and purchased at the Tortworth sale. It is rather curious that we do not find more animals from this celebrated herd at our different stock shows. Mr. Gunter and his Duchesses, for instance, might surely shine here. Mr. Towneley's young animals were remarkably forward, giving every indication of that early maturity which is argued as one of the great recommendations of the Shorthorn; while the first and second prize cows—Mr. Booth's Bridesmaid, and Mr. Douglas' Rose of Summer—have, perhaps, taking them together as first and second, never been surpassed. Indeed, to show the excellence of this class, we may mention that Mr. Stratton's Matchless, herself a very perfect animal, claims only a simple commendation.

It would be difficult to say from what cause, but there is no breed of animal which is so uncertain an exhibitor as the Hereford. Of late years, in fact, the meetings have been generally against them. Even at Gloucester, if we recollect aright, the entry was but a poor one. At Carlisle, on the contrary, it was very good, and, taking the whole of the classes, considered by far the best we have had for a long period. There were many good judges, not so wedded to the Durhams, who considered Lord Berwick's bull as the best in the yard.

Of the Devons there was but a small show—compensated for, however, by the excellence of Messrs. Quartley's and George Turner's stock. Mr. Turner's cows were very generally admired, and certainly nothing could show higher breeding or finer quality. Mr. Farthing, who was the only competitor against the Devon men, received some well-merited commendations—the "*highly*" proves how close he was to the prize animals.

Coming on to the Scotch Cattle, strange to say, we have the entries yet more limited. In four distinct classes for Ayrshires there were altogether but a dozen entries—for the best bull of any age but one bull sent. In the Angus and other Polled Breeds there were four classes, with just four animals to contend for them—one in class one, none in the next, two in the third, and one in the fourth. The Highland and other Horned Breeds numbered four classes and three beasts! Nevertheless, almost all the prizes offered were awarded, although beyond a pick or two from the Angus and the Ayrshire there was nothing of extraordinary merit. It was the weak feature of the whole show. In the special prizes offered by Mr. Head, the Galloways showed much stronger. Every class was well-filled, and both in the cows and bulls there were some animals of much excellence, which came in for a great deal of observation from breeders who had hitherto seen but little of them. We cannot help thinking that our Scotch friends have sadly missed their opportunity, and that it would have been to their advantage to have shown us even something more than Clydesdale horses, Galloway cattle, or mountain sheep.

Coequal in every way with any other department—taking at length their proper position in the exhibition of an English agricultural society—we have the show of horses. It is but a very few years since that we heard members of the Council assert that it was impossible to obtain anything like a becoming entry of horses for the majority of those prizes they might wish to offer. It is but two years since that we saw at Gloucester one of the very weakest collections of horses, of almost any sort, that any such public occasion could be supposed to make up. It is only right to add that this extraordinary improvement is no merely lucky chance, or turn in the wheel of Fortune. Much has been done in the interim. Something by the Council of the Society, and more by those friends they have since visited. As members of and spectators at the recent meetings of the national society, we owe something far beyond any formal vote of thanks to the mayors of Lincoln and Carlisle. By their judicious aid a new spirit has been infused into a weak place, and it will be our own fault if this be not only kept up, but yet still further encouraged. Despite ploughing by steam which is to come, and travelling by steam that has come, there is no branch of a farmer's duties that needs more impressing upon him than this greater attention to the breeding of horses. And this is not merely to the breeding of heavy draught horses, but even of hacks and hunters. The Lincolnshire farmers—not the worst in the world—breed their hacks and hunters. The Yorkshiremen have theirs, too, and both with a profit. There are other good farmers, a sad majority so far, who have not a cart-horse fit to show, or a hack that ought to be ridden off their own holding.

It is these gentlemen that the Royal Agricultural Society can now aid. It is in ministering to this common want that the English Society now stands pre-eminent. Neither the Scotch nor the Irish national associations have anything like a *generally*

good show of horses; nothing, in fact, so far as we have seen, worthy of them. It is, so, rather a proud thing to say, that if you want to see a good horse you must go to the English show. You have him here of every variety—the best to breed race horses, hunters, coach horses, and cart horses. At least, we speak from what we saw at Carlisle; and no one who was there will gainsay us.

But a very short time ago—we must still look back to see what has been done—perhaps one hunter stallion might be ready to take any premium offered under the auspices of the Society. They would not show, it was said. The owners of horses, already in repute, would not risk their being deteriorated by the awards going against them. The best answer to this is the Carlisle Meeting. For the Mayor's prize of forty guineas, there were thirteen thorough-bred stallions shown, and these not merely some of the best bred—with the fame not only of race horses—but many of them winners of prizes at local agricultural societies, as stallions to get hunters. Amongst these were The Era, St. Bennett, A British Yeoman, and The Cure. The premium, it will be seen, was awarded to an Irish-bred horse, Ravenhill, but now standing in the neighbourhood of Carlisle; his chief opponent being The British Yeoman. It must, indeed, have been a very nice point between the two, the Yeoman being certainly the finer horse. A great many of his stock, of all ages, from foals to three-year-olds, were in the yard, and a more promising lot from one horse has seldom been brought together.

The class of coaching stallions, also a special prize from Mr. Richard Ferguson, the owner of Ravenhill, hardly produced so strong a class. This, however, was well carried out by another series of special prizes from the Local Committee, which included, and particularly shone in, hunter and harness mares and geldings. Some of the brood mares were very far beyond even what one is accustomed to rank as "a good sort." If we might instance one, it would be Sir Wilfred Lawson's Retriever mare, "Madam," which, with her three-year-old colt by The British Yeoman, and the foal at her foot, also by the Yeoman, made up a wonderful family trio. They were classed as harness horses—we should be inclined to put them to something better. The prizes coming directly from the Society were confined to horses for agricultural purposes, including four distinct classes of Clydesdales. The first prize in the open class went to a Leicestershire horse, "Nonpareil," which took the second prize at Lincoln last year, and also the prize as a two-year-old at Windsor. He is now, at six years old, grown into a very fine horse, combining very happily those two great recommendations of a draught horse, strength and activity. The whole of this class, as well as the two for younger horses, was very strongly represented, while some of the mares and fillies were even better. The two prize mares might be instanced, while the whole class of fillies were generally commended. The entries in horses for agricultural purposes included some from nearly all parts of the kingdom. Amongst these, the few Suffolks shown might by many have been thought worthy a better place. A filly of Mr. Barthropp's was, indeed, very nearly taking a prize in the strongest of all these classes. It struck us, however, that the Suffolk, either by judge or jury, was scarcely so well appreciated as he might have been.

The Clydesdales, though a good, was by no means a uniform or a large show. The first-prize horse was a long way the best of his entry, and the same may be said of Mr. Douglas's mare. One or two of the aged stallions rather disappointed us in what we expected to find as the common character of the Clydesdale horse. There was hardly that light active *look* which, at least, one has been led to associate with the horses of the Clyde. We question whether generally these might not have been better.

The chief strength of the sheep show was with the Leicesters, Cheviots, and Black-faced Mountaineers, to all of which the breeders on and over the Border very largely contributed. In the Leicesters, however, they had to succumb to the two best flocks we have—those of Messrs. Sanday and Pawlett, who divided the prizes between them—the lion's share going to the former. The entry of Shearling Rams was very large, while it was almost as remarkable for uniform excellence. Our Scotch friends appear now to depend less and less on a large coarse sheep, and proportionately more on purity of breed. Compared with the other Longwools or Cotswolds, of which there was but a short show, the Leicester has a very refined look, and from what we could gather the comparison was altogether in his favour. There is still no denying that the Cotswolds are extraordinary sheep, the size of some of them being really "prodigious." The entries here were mostly from their own head-quarters in Gloucestershire, and Messrs. Lane, Garne, and Beale Brown again in the ascendant.

In the Cheviots and Mountain Sheep, the north was unquestionably better represented than in any other of those classes in which breeders from those districts might have been expected to distinguish themselves. As special prizes, both sorts were eminently successful—the black-faced twisted-horned mountain sheep giving a local character to the meeting that should have been further carried

out by a better display of the rough-coated Highland cattle. Nothing can be more different than these two varieties of sheep, while to the eye of the stranger the Cheviot looks by far the more useful of the two. Still, for a hard life, there is said to be nothing like a mountain flock.

The Southdowns gave way here to the Leicesters, and the show of them was consequently but a small one. They included, however, many of our best breeders—the Duke of Richmond, Lord Walsingham, Lord Chichester, Mr. Rigden, and Mr. Lugar. Mr. Jonas Webb's entries were not sent; but his sheep were becomingly represented by Mr. Rigden, who took three out of the four prizes for rams with sheep bred directly from the Babraham flock. In the ewes, Mr. Lugar had a pen of five very beautiful and nicely-matched, which deservedly held the head place in their class, being well backed by two good selections from Lord Walsingham's, though by no means of so high a *caste* as the first prize pen.

The pigs were chiefly remarkable for the immense size which some of them had attained, and the absurd state in which they were exhibited. The judges disqualified some from being entered in wrong classes, and others, by the aid of Professor Simonds, for being over age. They might have very justly extended these condemnations, and sent many more out of the Yard as not being in a fit state to breed from. We really believe that, had the weather been fine, and the sun's rays anything as strong as we have had them during this month, some of the unhappy brutes could not have lived through the week. As it was, we heard one or two had to be physicked as they lay—stand they hardly could; and if the fat pigs of the Smithfield week can be made fatter than these, then perhaps we may allow that, in this particular section of the show, one is a breeder's and the other a butcher's. At present we confess we cannot mark the distinction. This department of the Yard was not quite on a par with the excellence to be found in others; though of the two classes, large and small breeds, the small pigs, both of the black and of the white sorts, were much to be preferred.

A very ragged, as well as a very limited poultry show, to be commended only for a few good Dorkings, completes our synopsis of the live stock catalogue. The time of year is said to be against this new feature. It is very certain that, so far, the poultry exhibition has not been worthy of the society.

From a cause very easily explained, the implement yard was not numerically so well filled as usual. We are inclined, however, to regard this as anything but a falling off. The northern part of the kingdom is not famous for agricultural implement makers. Beyond the Busbys and Crosskills of Yorkshire, there is scarcely a firm of any very high repute in this particular branch of mechanics. This will itself go far to account for a comparatively small show. But this is not all. There was a day, and not a distant one either, when the implement department of the Royal Agricultural Shows was crowded with inventions, not half of which were half perfected. The evil arising from this was manifest enough. At present we have not, may-be, so much to labour through, but almost every piece of machinery has now an established character and a recognized use. Manufacturers are gradually declining unprofitable collision with each other, and directing their energies more to the improvement of such machinery as they find they excel in. Thus—the Ransomes, the Howards, and Busbys are known for their ploughs; the Hornsbys, Tuxfords, and Clayton and Shuttleworth, as famous for their steam-engines. Crosskill has his carts and his clod-crushers, Garrett his drills and his dressers; while the two London firms, Messrs. Dray, and Burgess and Key, with Crosskill, here again, are still approaching nearer and nearer to the realization of a reaping-machine.

This was essentially the character of the Carlisle Implement Exhibition. With one grand exception there was no novelty, but everyone was found to be still further perfecting what he had already been distinguished for. This was particularly the case with the steam-engines, in the order of merit for which some very remarkable changes occurred. The saving in coal in the first-prize steam-engine is regarded as something extraordinary, and the performance created a very general sensation. It is but right to add that the award was unanimously agreed to, while the achievement must have the effect of calling forth all the energies of other firms who have so far, perhaps, been but too well satisfied with what they had attained to. The steam-engine trials at Chelmsford next year will be something more than usually interesting.

Of almost equal importance, and unquestionably of more attraction to the agriculturist himself, are the trials of the ploughs and the reaping machines. In the former of these the struggle was, as usual, between the Ransomes and the Howards, for both of which Mr. Ransome was declared successful; Howard's lighter plough receiving a high commendation. The ploughs of both these firms were beautifully turned out, the competition in the light or general purpose pluogh very close, and the award in this class one of the few that was at all canvassed. We speak on the authority of one of our best judges who saw the work when we say, that the Bedford plough had hardly justice done to it; while a contemporary declares decisively

that it ought to have had the prize. We are always loath to go against the judges, and in doing so here we are only quoting the opinion of others.

After but a partial experiment upon rye, the further trial of the reapers has been postponed until harvest, when four have been selected to meet again on the farm of the President, Mr. Miles, in the neighbourhood of Bristol. These are Crosskill's Bell, Dray's Hussey, Burgess and Key's M'Cormick, and Palmer's—a Scotch implement. Crosskill's, Dray's, and Burgess and Key's have all been much improved, the two latter particularly in the delivery; and the race, according to the best judges, is supposed to be between them—Dray, from his past successes, being rather the favourite.

Few even of the most sanguine ever expected to see the two hundred pound prize for a steam plough awarded at the Carlisle meeting. In simple truth we are yet a long way from any such a realization. Of all those entered and tried, or attempted to be tried, none did much to advance us in this direction. It is doubtful whether, after all, Boydell's implement will ever be of much use in cultivating the land; while Usher's, much longer known and much more talked of, proved little less than a lamentable failure. Cumbrous and curious in the extreme, it was long before it could be got to move at all; and when it did, it commanded but few admirers. By far the most satisfactory of all the steam implements to be used in the field was Fowler's draining plough, which was exhibited at work outside the yard. It was much appreciated, and, as now amended, promises to be a serviceable and economical invention for landowners and occupiers. Surely, though, this should come directly under the proceedings of the Society, which would no doubt provide for its being put to work. It is just one of those cases where the authority of such a recommendation would be doubly useful.

Amongst other more modern discoveries was Chandler's liquid manure drill, which would now appear to have no competitor. Mr. Spooner's was entered, but not exhibited. The Messrs. Garrett, however, had Chambers' clever manure distributor in their standing, and which, as with Chandler's, again obtained a premium.

In thus hastily glancing over the more prominent features in the implement department—to be far more fully discussed hereafter—we must give a word to those gentlemen who, as stewards and judges, labour so hard and so disinterestedly. As Colonel Challoner well said at the dinner, none but those who have undertaken them can have any idea as to what these duties are. In order as much as possible to facilitate and arrange them, so that every one might be well advised beforehand as to what was coming on, we would offer to the consideration of the Council a suggestion which was impressed upon us by one of the implement judges at this meeting. The stewards are appointed on a very excellent plan, so that from the apprenticeship of a junior they become well acquainted with the business of their department by the time they arrive at a seniority in office. Not so the sub-stewards, or head yardsman, and head fieldsman. At every fresh meeting the judges find fresh men, who have of course to be broke to their work, becoming well up to it just about the time the meeting is over. This is a mistake. Both should be permanent appointments, and both stewards and judges would benefit by their being so. We will say nothing of the public, who, in some of the confusion of last week, frequently missed what they came chiefly to see.

Following this, we give the prize lists of the two departments, and with them a report of the dinner—the most fully attended we ever remember. It was the crowning compliment to Mr. Miles' year of office, and few could have better deserved it. From what we have seen of his kind, unassuming, and business-like conduct at many meetings of the Society, we believe we are justified in recording him as one of the best of those who have been called to the chair. This is high praise, but we feel it is merited. The dinner was remarkable for two or three very good speeches, and for a little "sensation," that might have proceeded to something worse. Strange to say, at such a time as this, the Council by some oversight had omitted "The Army and Navy" from their toast list. When, however, the turn came, the meeting with some warmth demanded it; and Mr. Miles, with very excellent discretion at once acceded to the command. Certainly the most happy of the addresses which followed, was that from Mr. Thompson, the new editor of the *Journal*. It had all the recommendations of good taste, humour, and fluency in its favour, and we confess that the report by no means does it justice. Sir James Graham had a congenial theme in uniting agriculture, manufactures, and commerce; and Sir Stafford Northcote put the services of the railways in their best light. So much so indeed, that the gentleman who responded was a little overpowered, and ingenuously admitted that as a railway director he was far more accustomed to be abused than complimented. What was said, however, was true enough—railways and agriculture have done much for each other. If any example of this were wanting, it is to be found in the progress of the Royal Agricultural Society.

PRIZES FOR CATTLE, &c.

SHORTHORNS.

JUDGES.—Captain Thomas Ball, Ireland.
Mr. Richard Dudding, Panton, Wragby.
Mr. Thomas Parkinson, Langenhoe Rectory, Colchester.

CLASS 1.—Bulls calved previously to the 1st of July, 1853, and not exceeding four years old.

First prize of £30 to Richard Booth, of Warlaby, Northallerton, Yorkshire; second of £15 to the Right Hon. Lord Feversham, of Duncombe Park, Yorkshire.

Highly commended.—Mr. Henry Ambler's and Mr. Charles Towneley's bulls.

Commended.—Mr. William Fletcher's and Mr. John Cartmell's bulls.

CLASS 2.—Bulls calved since the 1st of July, 1853, and more than one year old.

First prize of £25 to Charles Towneley, of Towneley Park' Burnley, Lancashire; second of £15 to T. H. Fawkes, of Farnley Hall, Otley, Yorkshire.

Highly commended.—A second of Mr. Charles Towneley's bulls.

Commended.—Mr. Francis Fowler's bull.

CLASS 3.—Bull calves, above six and under twelve months old.

The prize of £5 to Charles Towneley, of Towneley.

Commended.—Viscount Hill's and Mr. Robert Jefferson's bull calves.

CLASS 4.—Cows in milk or in calf.

First prize of £20 to Richard Booth, of Warlaby; second of £10 to James Douglas, of Athelstaneford Farm, Drem, Haddington.

Highly commended.—Mr. John Booth's cow.

Commended.—Mr. Richard Stratton's two cows, and Mr. Thomas Moorhouse's cow.

CLASS 5.—Heifers in milk or in calf, not exceeding three years old.

First prize of £15 to Charles Towneley, of Towneley; second of £10 to Richard Booth, of Warlaby.

Highly commended.—A second of Mr. Charles Towneley's heifers.

Commended.—Mr. Richard Stratton's heifer.

CLASS 6.—Yearling Heifers.

First prize of £10 to John Hall, of Kiveton Park, Worksop; second of £5 to Charles Towneley, of Towneley.

Highly commended.—Mr. Charles Towneley's and Mr. William Fletcher's heifers.

Commended.—Viscount Hill's, Mr. Richard Stratton's, Mr. Jno. S. Crawley's, Mr. Stewart Marjoribanks, and Mr. George Sainsbury's yearling heifers.

HEREFORDS.

JUDGES—Mr. H. Chamberlain, Desford, Leicester.
Mr. E. L. Franklin, Ascott, near Wallingford.
Mr. H. Trethewy, Grampound, Cornwall.

CLASS 1.—Bulls calved previously to the 1st of July, 1853, and not exceeding four years old.

First prize of £30 to the Right Hon. Lord Berwick, of Cronkhill, near Shrewsbury; second of £15 to the Right Hon. the Earl of Radnor, Coleshill House, Highworth.

Highly commended.—Mr. W. S. Powell's, Mr. Richard Hill's, and Mr. John Moorhouse's bulls.

CLASS 2.—Bulls calved previously to the 1st of July, 1853, and more than one year old.

First prize of £25 to the Right Hon. Lord Berwick; second of £15 to John Monkhouse, of the Stow, Hereford.

CLASS 3.—Bull-calves, above six and under twelve months old.

The prize of £5 to Mr. Edward Williams, of Llowess Court, near Hay, Radnorshire.

CLASS 4.—Cows in milk or in calf.

First prize of £20 to John Monkhouse, of the Stow, Hereford; second of £10 to Philip Turner, of the Leem, Pembridge, Leominster.

Commended.—Mr. John Ackers's cow.

CLASS 5.—Heifers in milk or in calf, not exceeding three years old.

First prize of £15 to John Walker, of Westfield House, Holmer, Hereford; second of £10 to William Perry, of Cholstrey, Leominster.

CLASS 6.—Yearling heifers.

First prize of £10 to the Right Hon. Lord Berwick; second of £5 to Walter Mayberry, of Brecon.

Note.—Classes 1 and 6 generally commended.

DEVONS.

JUDGES.—Messrs. H. Chamberlain, E. L. Franklin, and H. Trethewy.

CLASS 1.—Bulls calved previously to the 1st of July, 1853, and not exceeding four years old.

First prize of £30 to James Quartly, of Molland House, South Molton, Devon; second of £15 to James Quartly, of Molland.

Commended.—Mr. Walter Farthing's bull.

CLASS 2.—Bulls calved since the 1st of July, 1853, and more than one year old.

First prize of £25 to George Turner, of Barton, Exeter; second to Walter Farthing, of Stowey Court, Bridgewater.

CLASS 3.—Bull-calves, above six and under twelve months old.

The prize of £5 to George Turner, of Barton.

CLASS 4.—Cows in milk or in calf.

First prize of £20 to George Turner, of Barton; second of £10 to George Turner, of Barton.

Highly commended.—Mr. Walter Farthing's cow.

CLASS 5.—Heifers in milk or in calf, not exceeding three years old.

First prize of £15 to James Quartly, of Molland; second of £10 to George Turner, of Barton.

Highly commended.—Mr. Walter Farthing's and Mr. Thomas Webber's heifers.

CLASS 6.—Yearling heifers.

First prize of £10 to James Quartly, of Molland; second of £5 to James Quartly, of Molland.

Commended.—Mr. Thomas Webber's yearling heifer.

SCOTCH CATTLE,

Excepting Galloway Cattle, which are provided for in the Special Prizes offered by George Head Head, Esq.

JUDGES.—Mr. P. Graham, Scotland.
Mr. Barns, ,,
Mr. R. Hector, ,,
Mr. W. M'Culloch, ,,

I. AYRSHIRE.

CLASS 1.—Bulls of any age.

The prize of £10 to John Stewart, of Strathaven, Lanarkshire.

CLASS 2.—Yearling Bulls.

The prize of £10 to John Stewart, of Strathaven.

CLASS 3.—Cows of any age.

The prize of £10 to William Muir, of Hardington Mains, Wiston by Biggar, Lanarkshire.

CLASS 4.—In-calf Heifers.

The prize of £5 to John Stewart, of Strathaven.

Commended.—Mr. William Muir's Heifer in-calf.

II. ANGUS AND OTHER POLLED BREEDS.

CLASS 1.—Bulls of any age.

The prize of £10 to William M'Combie, of Tillyfour, Aberdeen.

CLASS 2.—Yearling Bulls.

The prize of £10. No competition.

CLASS 3.—Cows of any age.

The prize of £10 to William M'Combie, of Tillyfour.

CLASS 4.—In-calf Heifers.

The prize of £5 to William M'Combie, of Tillyfour.

III. HIGHLAND AND OTHER HORNED BREEDS.

CLASS 1.—Bulls of any age.

The prize of £10. No competition.

CLASS 2.—Yearling Bulls.

The prize of £10 to Neill Malcolm, of Poltalloch, Calton Mor, Lochgilphead.

CLASS 3.—Cows of any age.

The prize of £10 to Neill Malcolm, of Poltalloch.

CLASS 4.—In-calf Heifers.

The prize of £5. No competition.

HORSES.

JUDGES.—Mr. J. H. Bland,
Mr. T. Hunt.

I. AGRICULTURAL HORSES GENERALLY.

CLASS 1.—Stallions for Agricultural Purposes, foaled previously to the 1st of January, 1853.

First prize of £30 to E. and M. Reed, Beamish Burn, Chester-le-street, Durham; second of £20 to S. and R. Spencer, Flecknor, near Daventry.

CLASS 2.—Stallions for Agricultural Purposes, foaled in the year 1853.

First prize of £20 to Robert Smith, Ladyland, Dumfries, Kirkcudbright; second of £10 to Henry Bailey, Walgaston Farm, Berkeley, Gloucestershire.

CLASS 3.—Agricultural Stallions, foaled in the year 1854.

The prize of £15 to S. and R. Spencer, Flecknor, near Daventry, Warwickshire.

CLASS 4.—Mares and Foals for Agricultural Purposes.

First prize of £20 to D. Bird, Catterlen Hall, Newton, near Penrith; second of £10 to Robert Murray, Park Gate Hall, Wigton.

CLASS 5.—Two years old Fillies for Agricultural Purposes.

First prize of £15 to Edward Holland, Dumbleton Hall, Evesham, Worcester; second of £10 to Edward Holland, Dumbleton.

Highly commended.—Mr. N. E. Barthropp's two year old fillies.

II. CLYDESDALE HORSES.

CLASS 1.—Stallions foaled previously to the 1st of Jan., 1853.

The prize of £20 to Charles Phillips, Cracrop, Brampton, Cumberland.

Highly commended.—Messrs. E. and M. Reed's stallion.

CLASS 2.—Stallions foaled in the year 1853.

The prize of £15 to James Newbigging, Redhall, Kirkpatrick Fleming, Ecclefechan, Dumfries.

CLASS 3.—Mares, with foals at foot.

The prize of £10 to James Douglas, Athelstaneford Farm, Drem, Haddington.

CLASS 4.—Fillies foaled in the year 1853.

The prize of £5 to James Patterson, Terrons, Langholm, Dumfries.

SHEEP.

I. LEICESTERS.

JUDGES.—Mr. R. B. Aylmer, Yorkshire.
Mr. W. Torr, Aylesby, Great Grimsby, Lincolnshire.
Mr. J. Wright.

CLASS 1.—Shearling Rams.

First prize of £25 to William Sanday, of Holmepierrepont, Nottingham; second of £15 to T. E. Pawlett, of Beeston, Beds.

Highly commended.—Mr. William Sanday's ram.

Commended.—Mr. T. E. Pawlett's and Mr. William Sanday's rams.

CLASS 2.—Rams of any age.

First prize of £25 to William Sanday, of Holmepierrepont; second of £15 to William Sanday, of Holmepierrepoint.

Highly commended.—Mr. William Sanday's ram.

Commended.—Mr. T. E. Pawlett's and Mr. Sanday's rams.

CLASS 3.—Pens of five Shearling Ewes of the same flock.

First prize of £20 to William Sanday, of Holmepierrepont; second of £10 to William Sanday, of Holmepierrepont.

II. SOUTH-DOWN, OR OTHER SHORT-WOOLLED SHEEP.

JUDGES.—Mr. G. Brown, Avebury, Marlborough.
Mr. H. P. Hart, Beddingham, Lewes, Suffolk.
Mr. J. Waters, Eastbourn.

CLASS 1.—Shearling Rams.

First prize of £25 to William Rigden, of Hove, Brighton; second of 15*l.* to the Earl of Chichester, of Stanmer Park, Lewes.

Commended.—Mr. William Rigden's and Mr. Henry Lugar's shearling rams.

CLASS 2.—Rams of any other age.

First prize of 25*l.* to William Rigden, of Hove; second of £15 to William Rigden, of Hove.

CLASS 3.—Pens of five Shearling Ewes of the same flock.

First prize of 20*l.* to Henry Lugar, of Hengrave, Bury St. Edmonds; second of 10*l.* to Lord Walsingham, of Merton Hall, Thetford.

Commended.—A second pen of Lord Walsingham's shearling ewes.

III. LONG-WOOLLED SHEEP.

Not qualified to compete as Leicesters.

JUDGES.—Mr. H. Aylmer, Walworth, Darlington.
Mr. T. B. Colton.
Mr. N. C. Stone, Rowley Fields, Leicester.

CLASS 1.—Shearling Rams.

First prize 25*l.* to William Lane, of Broadfield Farm, near Northleach; second, of 15*l.* to William Hewer, of Northleach, Gloucester.

Commended.—Mr. William Hewer's and Mr. William Lane's rams.

CLASS 2.—Rams of any other age.

First prize of 25*l.* to William Garne, of Aldsworth, Northleach; second, of 15*l.* to William Lane, of Broadfield.

Highly commended.—Mr. George Fletcher's ram.

Commended.—Mr. Thomas B. Brown's and Mr. James Walker's rams.

CLASS 3.—Pens of five Shearling Ewes of the same flock.

First prize of 20*l.* to Thomas Beale Brown, of Hampen Andoversford, Gloucester; second, of 10*l.* to William Lane, of Broadfield.

Commended.—Mr. T. B. Brown's, Mr. George Fletcher's, and Lord De Mauley's ewes.

MOUNTAIN SHEEP.

I. HERDWICKS.

JUDGES.—Mr. W. Dodd, Scotland.
Mr. R. Donkin, „
Mr. A. Douglas, „

CLASS 1.—Shearling Rams.

The prize of 7*l.* to George Robinson, of Orton Hall, Westmoreland.

CLASS 2.—Rams of any other age.

The prize of 8*l.* to John Mounsey, of Askham, Westmoreland.

CLASS 3.—Pens of five Shearling Ewes.

The prize of 5*l.* to George Robinson, of Orton Hall, Westmoreland.

II. OTHER BLACK-FACED MOUNTAIN SHEEP.

CLASS 1.—Shearling Rams.

The prize of 7*l.* to Hugh Shield, of High Acton, Allendale, Northumberland.

CLASS 2.—Rams of any other age.

The prize of 8*l.* to Charles Summers, of Whitfield, Haydon Bridge.

CLASS 3.—Pens of five Shearling Ewes.

The prize of 5*l.* to James Brydon, of Moodlaw, Langholm, Dumfries.

PIGS.

JUDGES.—Mr. P. Halse.
Mr. H. Eddison, Gateford, Worksop, Nottinghamshire.
Mr. W. Hesseltine, Warlaby House, Brigg, Lincolnshire.

CLASS 1.—Boars of a large breed.

First prize of £10 to Thomas Horsfall, of Burley Hall, Otley, Yorkshire; second, £5, to Charles Jackson, of Goodram Gate, York.

CLASS 2.—Boars of a small breed.

First prize of £10, to William Hatton, of Addingham, Otley Yorkshire; second, £5, George Turner, of Barton, Exeter.

CLASS 3.—Sows of a large breed.

The prize of £10 to John Harrison, jun., of Heaton Norris, Stockport.

Highly commended.—Mr. Thomas Horsfall's sow.

Commended.—Mr. James Farish's and Mr. W. B. Wainman's sows.

CLASS 4.—Sows of a small breed.

The prize of £10 to R. H. Watson, of Bolton Park, Wigton.

Specially commended.—Mr. William Jopson's sow.

Highly commended.—Mr. George Turner's and Mr. Thos. Horsfall's sows.

Commended.—Mr. George Mangle's and Mr. H. S. Hayward's sows.

CLASS 5.—Pens of three breeding Sow-Pigs of a large breed of the same litter, above four and under eight months old.

The prize of £10 to W. I Sadler, of Bentham Purdon, Swindon, Wilts.

Highly commended.—Mr. W. B. Wainman's three sow pigs.

CLASS 6.—Pens of three breeding Sow-Pigs of a small breed, of the same litter, above four and under eight months old.

The prize of £10 to R. H. Watson, of Bolton.

Highly commended.—Mr. Jonathan Brown's three sow pigs.

SPECIAL PRIZES.

GIVEN BY THE CARLISLE LOCAL COMMITTEE.

CHEVIOT SHEEP.

JUDGES.—Mr. Dodd.
Mr. R. Donkin.
Mr. A. Douglas.

CLASS 1.—Rams not more than four-shear.

First prize of £15 to Thomas Elliot, of Hindhope, Jedburgh, Roxburghshire; second of £7 to Thomas C. Borthwick, of Hopsrig, Langholm, Dumfries.

Highly commended.—Mr. Thomas Elliott's and Mr. William Aitchison's rams.

Commended.—Mr. John Carruther's ram.

CLASS 2.—Shearling Rams.

First prize of £15 to Thomas Elliot, of Hindhope, Jedburgh; second of £8 to Thomas C. Borthwick, of Hopsrig.

Highly commended.—Mr. Thomas Elliot's and Mr. William Aitchison's rams.

Commended.—Mr. Thomas C. Borthwick's shearling ram.

CLASS 3.—Pens of five Ewes not more than four-shear.

First prize of £10 to Thomas C. Borthwick, of Hopsrig; second prize of £5 to Thomas C. Borthwick, of Hopsrig.

CLASS 4.—Pens of five Shearling Ewes or Gimmers.

First prize of £10 to Thomas C. Borthwick, of Hopsrig; second prize of £5 to Thomas Elliot, of Hindhope.

HORSES.

JUDGES.—Mr. W. Greaves, Matlock-Bath, Derbyshire.
Mr. W. Walker, Wilsie, near Doncaster.

CLASS 1.—Harness Mares, with Foals at foot.

The prize of £15 to Sir Wilfred Lawson, Bart., of Brayton, Carlisle.

CLASS 2.—Three-year-old harness Geldings.

The prize of £10 to Sir Wilfred Lawson, Bart.

CLASS 3.—Mares for breeding Hunters, with Foals at foot.

The prize of £15 to Thomas Swarbreck, of Sowerby, Thirsk.

CLASS 4.—Three-year-old Geldings for hunting.

The prize of 10*l.* to Robert Barton, of Barrack Town, Carlisle.

CLASS 5.—Three-year-old Cart Fillies.

The prize of 10*l.* to Miles Bell, of Brunstock, Carlisle.

Class 5 generally commended.

CLASS 6.—Three-year-old Cart Geldings.

The prize of 10*l.* to Ann Tinning, Oak Bank, Longtown, Cumberland.

CLASS 7.—Two-year-old Cart Gelding.

The prize of 10*l.* to William Stordy, of Moorhouse, Carlisle.

GIVEN BY GEORGE HEAD HEAD, ESQ.

GALLOWAY CATTLE.

JUDGES.—Mr. P. Graham.
Mr. Barns.
Mr. R. Hector.
Mr. W. Mc Culloch.

CLASS 1.—Bulls not more than four years old on the 1st of July, 1855.

First prize of 25*l.* to James Graham, of Meikle Culloch, Dalbeattie, Kirkcudbright; second of 10*l.* to John Carruthers, of Kirkhill, Moffat, Dumfries.

Commended.—Mr. John Sutton's bull.

CLASS 2.—Bulls calved since the 1st of July, 1853, and more than one year old.

First prize of 15*l.* to James Beattie, of Newbie House, Annan, Dumfries; second of 10*l.* to John Birrell, of Guards, Gretna Green.

CLASS 3.—Cows in calf or milk.

First prize of 15*l.* to James Beattie, of Newby House, Annan, Dumfries; second of 10*l.* to John Grainger, of Souterfield, Abbey Holme, Cumberland.

CLASS 4.—Pairs of Heifers in Calf or Milk, and not exceeding three years old.

First prize of 10*l.* to George Riddick, of Greenhill-head, Lockerbie; second of 5*l.* to John Pearson, of Langrigg, Cumberland.

GIVEN BY ROBERT FERGUSON, ESQ., MAYOR OF CARLISLE.

STALLIONS.

JUDGES.—Mr. W. Greaves, Matlock-Bath, Derbyshire.
Mr. W. Walker, Wilsie, near Doncaster.

CLASS 1.—Thorough-bred Stallion.

The prize of 40*l.* to Richard Ferguson, of Harker, Carlisle, for Ravenhill, by Ugly Buck, out of Sylph, by Filho-da-Puta.

CLASS 2.—Coaching Stallion.

The prize of 30*l.* to J. Shaw, of Acomb Hall, York.

PRIZES FOR IMPLEMENTS.

JUDGES.

IN THE YARD.

STEAM ENGINES—
Mr. J. V. Gooch, Civil Engineer in the Eastern Counties Railway Company.
Mr. W. Owen, Rotherham.

BARN WORKS—
Mr. H. B. Caldwell, Hilborowe Hall, Brandon Norfolk.
Mr. W. Blackett, Durham.

MILLS, CHAFF CUTTERS, &C.—
Mr. J. Clark, Long Sutton, Wisbeach.
Mr. J. H. Nalder, Alvescot, Lechlade.

MISCELLANEOUS—
Mr. L. Furniss, Birchill Farm, Bakewell, Derbyshire.
Mr. J. J. Rowley, Rawthorne, Chesterfield.

IN THE FIELD.

PLOUGHS, CULTIVATORS, &C.—
Mr. T. Huskinson, Epperstone, Southwell, Notts.
Mr. T. Scott, Ripon.

DRILLS, &C.—
Mr. T. W. Granger, Stretham Grange, Ely.
Mr. C. S. Read, Norfolk.

STEAM CULTIVATORS and REAPING MACHINES—

By two engineering and four field judges.

For the plough best adapted for general purposes—£5, to Ransomes and Sims.

For the plough best adapted for ploughing more than nine inches deep—£5, to Ransomes and Sims.

For the best machine for making draining tiles or pipes for agricultural purposes—£5, to John Whitehead.

For the best cultivator, grubber, and scarifier—£5, to Richard Coleman.

For the best drill for general purposes—£10, to R. Garrett and Son.

For the best corn and seed drill—£10, to R. Hornsby and Son.

For the best and most economical corn drill for small occupations—£5, to R. Hornsby and Son.

For the best and most economical small occupation seed and manure drill for flat or ridge work—£5, to Holmes and Son.

For the best turnip drill on the flat, with manure—£5, to R. Garrett and Son.

For the best turnip drill on the ridge, with manure—£5, to R. Hornsby and Son.

For the best liquid manure or water drill—£10, to R. and J. Reeves.

For the best manure distributor—£10, to R. Garrett and Son.

For the best horse hoe on the flat—£5, to R. Garrett and Son.

For the best horse hoe for setting out or thinning turnips—£5, to R. Garrett and Son.

For the best reaping machine—£30; for the second best—£20—further trials deferred until harvest.

For the best portable steam engine, not exceeding eight-horse power, applicable to thrashing or other agricultural purposes—£20, to Tuxford and Sons; for the second-best—£10, to Clayton, Shuttleworth, and Co.

For the best fixed steam engine, not exceeding eight-horse power, applicable to thrashing or other agricultural purposes—£20, to Ransomes and Sims; for the second-best—£10, to Barrett, Exall, and Andrews.

For the best portable thrashing machine, not exceeding six-horse power, for larger occupations—£10 to Ransomes and Sims.

For the best portable thrashing machine, not exceeding eight-horse power, with shaker, riddle, and winnower, that will best prepare the corn for the finishing dressing machine: to be driven by steam—£20, to R. Hornsby and Son.

For the best fixed thrashing machine, not exceeding eight-horse power, with shaker, riddle, and winnower, that will best prepare the corn for market: to be driven by steam—£20, to Clayton, Shuttleworth, and Co.

For the best machine to dress corn for market after it has been screened and riddled—£5, to R. Hornsby and Son.

For the best grinding mill for breaking agricultural produce into meal—£5, to Clayton, Shuttleworth, and Co.

For the best linseed and corn crusher—£5, to E. R. and F. Turner.

For the best chaff cutter, to be worked by horse or steam power—£5, to James Cornes.

For the best chaff cutter, to be worked by hand power—£3, to Richmond and Chandler.

For the best turnip cutter—£3, to B. Samuelson.

For the best machine to reduce roots to a pulp—£3, to F. Phillips.

For the best oilcake breaker for every variety of cake—£5, to R. Garrett and Son.

For the best bone mill, to be worked by steam or other power—£5, to A. Crosskill.

For the best churn—£3, to Burgess and Key.

The prize of £200 for a steam-cultivator that shall, in the most efficient manner, turn the soil, and be an economical substitute for the plough or the spade—was not awarded.

MISCELLANEOUS AWARDS.

Cotgreave's subsoil and trench plough—Silver medal, to Ransomes and Sims.

Patterson's clod crusher—Silver Medal, to John Palmer.

For adaptation of revolving screw in combined thrashing machine—Silver medal, to Clayton, Shuttleworth, and Co.

Patent grain and seed separator—Silver medal, to William Dray and Co.

A patent spring shaft car—Silver medal, to William Pierce.

Improved patent clod crusher—Silver medal, to Alfred Crosskill.

HIGHLY COMMENDED.

Plough adapted for general purposes, by James and F. Howard.

Plough adapted for ploughing more than nine inches deep, by William Busby.

As a broadshare, by E. H. Bentall.

Portable steam engine, by Barrett, Exall, and Andrews.

Portable steam engine, by R. Hornsby and Son.

Portable steam engine, by Ransomes and Sims.

Portable steam engine, by R. Garrett and Son.

Fixed steam engine, by Clayton, Shuttleworth, and Co.

Fixed steam engine, by Tuxford and Sons.

Grinding mill, by James Hayes.

Linseed and corn crusher, by W. P. Stanley.

A chaff cutter worked by steam and horse-power, by William Dray and Co.

A chaff cutter worked by hand, by James Cornes.

A chaff cutter worked by hand, by Smith and Ashby.

A cake breaker for every variety of cake, by R. Hornsby and Son.

Combined thrashing machine, by Clayton, Shuttleworth, and Co.

Drill for general purposes, by R. Hornsby and Son.

Corn and seed drill, by Richard Garrett and Son.

Small occupation manure drill, by Richard Garrett and Son.

Turnip drill on flat with manure, by R. Hornsby and Son.

Turnip drill on the ridge, by Richard Garrett and Son.

Corn dressing machine, by W. N. Nicholson.

Corn dressing machine, by Mr. Bunting.

Combined thrashing machine, by E. and T. Humphries.

Combined thrashing machine, by Tuxford and Sons.

Patent American churn, by William Dray and Co.

Moody's turnip cutter, by H. Carson.

Root pulping machine, by R. Garrett and Son.

HIGHLY COMMENDED, NO PRIZES HAVING BEEN OFFERED.

Horse rake, by J. and F. Howard.

Hay making machine, by Smith and Ashby.

Drill and land presser (new implement), by J. and F. Howard.

Ridge horse hoe, by J. and F. Howard.

Jointed iron harrows, by J. and F. Howard.

Drain, tile, and pipe machine, by Mr. Scragg.

A wrought iron gate for field purposes, by Hernulewicz, Maine, and Co.

COMMENDED.

Chaff cutter worked by hand, by Hill and Smith.

Cake breaker for every variety of cake, by A. Crosskill.

Grinding mill, by A. Crosskill.

Linseed and corn crusher, by James Woods.

Chaff cutter worked by horse and steam-power, by Barrett, Exall, and Andrews.

Chaff cutter worked by horse and steam-power, by Richmond and Chandler.

Chaff cutter worked by horse and steam-power, by R. Garrett and Son.

Portable steam engine, by Alfred Crosskill.

Portable steam engine, by Joseph Lee.

Fixed steam engine, by William Dray and Co.

For the plough best adapted for general purposes, by Wm. Busby.

For the plough best adapted for general purposes, by Wm. Ball.

For the plough best adapted for ploughing more than nine inches deep, by James and F. Howard.

For the plough best adapted for ploughing more than nine inches deep, by William Ball.

Cultivator, grubber, and scarifier (Biddell's) by Ransomes and Sims.

Small occupation corn drill, by Richard Garrett and Son.

Small occupation corn drill, by James Smyth and Son.

Horse hoe on the flat, by William Smith.

Barrel churn, by Robert Tinkler.

Patent root cutter, by Barnard and Bishop.

Patent root cutter, by Richmond and Chandler.

COMMENDED, NO PRIZES HAVING BEEN OFFERED.

Drill and land presser (new implement), by William Ball.
Hoe for loosening and tailing turnips (new implement), by William Lister.
Horse rake, by William Williams.
Hay making machine, by W. N. Nicholson.
Manure distributor, by Holmes and Son.
Ridge horse hoe, by William Busby.
Drill grubber, by Robert Sewell.
Washing and wringing machine, by Wm. Pearson and Co.
One-horse cart, by Smith and Ashby.
One-horse cart, by Crosskill and Co.
Portable saw mill, by Crosskill and Co.
Light one-horse waggon, by Dray and Co.
Portable farm bench and vice, by Dray and Co.
Iron sack truck, by Thomas Johnson.
Wrought-iron field gate, by Hill and Smith.
Cart turnip cutting machine, by Caldow and McKinnel.
Washing and wringing machine, by William N. Nicholson.
Corn rick stand, by Young, Peddie, and Co.
A patent farm railway (portable and improved), by Crosskill and Co.
A wrought-iron sheep trough, by Hill and Smith.
A pulping and mincing machine, by Arthur Lyon.
A pulping and mincing machine, by Samuel Nye.
A brick machine and pug mill combined, by Porter, Hind, and Porter.
A cart and cattle weighing machine, by Smith, Brothers, and Co.

THE DINNER

took place on Thursday—W. Miles, Esq., as President for the year, in the chair: supported by the Mayor of Carlisle (Robert Ferguson, Esq.), the Duke of Cleveland, Viscount Dillon, Lord Berners, Lord Wynford, Col. Lowther, M.P.; W. Marshall, Esq., M.P.; Baron Ricasoli, of Tuscany; Sir J. Heron Maxwell, Sir John Maxwell, the Very Rev. the Dean of Carlisle, M. De la Trehonnois, of Paris; the Hon. C. Howard, M.P.; Col. Rushout, M.P.; Mr. P. J. Dixon, Mr. Nathorn, Mr. G. H. Head, Mr. E. W. Hasell, Mr. Buller, Chairman of the Bath and Exeter Railway Company; Mr. W. Woods, Chairman of the Newcastle and Carlisle Railway Company; Mr. G. W. Hartley, Chairman of the Maryport Railway Company; Archdeacon Sandford, Professor Way, and Professor Simonds. The Vice-chair was filled by Col. Challoner: and near him were Mr. Frewen, M.P.; Mr. Child, M.P.; Mr. Kendall, M.P.; Rev. H. Lowther, Mr. C. Stewart, Capt. Ball, Mr. Van Bosch, of Rotterdam; Mr. J. Nanson, Town Clerk of Carlisle; and Mr. George Smith. There were also present Sir James Graham, Bart., M.P.; Hon. Mr. Coke, Sir John Ogilvy, Bart.; Sir P. Montague, Bart.; Sir Stafford H. Northcote, Bart., M.P., Sir T. Sebright, Bart.; Sir Pierce Morton, Sir Alexander Macdonald, Major Salmond, Mr. Dyke Acland, Mr. Thompson, Mr. Howard, of Greystoke; Mr. Howard, of Corby; Mr. Leopold Cust, Mr. Meredith, Mr. Wren Hoskins, Mr. Mechi, Mr. Jonas Webb, Mr. Fisher Hobbs, Mr. Brandreth Gibbs, Mr. Aitcheson, and a host of eminent agriculturists from far and near, which, in the crowded state of the room, it was impossible to identify.

After the health of Her Majesty had been duly honoured,

The President gave, "The health of Prince Albert, Albert Prince of Wales, and the other members of the Royal Family." He thought they might look upon Prince Albert as a brother farmer; for, not only had he frequently obtained prizes in this society, but he even went to Smithfield, where he invariably gained a prize or two. He must at the same time add that he (the president) had lately returned from Paris, where, he was happy to say, Prince Albert's name stood on the list with three prizes. So that his Royal Highness was ready to contend not only with the tenant-farmers of England in this country, but, when an international show took place, to send his cattle abroad, and to come off with success. He could assure this meeting that when it was known in Paris that Prince Albert was a successful candidate, it would have pleased them to have seen the enthusiasm of the French people there assembled. (Drunk with three times three).

The next toast the President had to propose was, "The health of the distinguished foreigners who had that day honoured the meeting with their company." Their meeting since the commencement of the society had never been without the presence of some eminent foreigners, including the most distinguished ambassadors in this country. He was sorry there was not, on the present occasion, an ambassador present to respond to this toast. Several had sent answers, and represented that the present state of public business would not permit their absence from London. Therefore, he had only to thank those gentlemen present who had done them the honour of attending their meeting (cheers). He could only say, for the English Agricultural Society, that they were proud indeed to see among them foreigners animated by the same desire as themselves to do good to the agriculture of their respective countries. Long might this interchange of national sentiment continue! He would only mention that they had the pleasure of having four gentlemen from different parts of Europe: they had Baron Ricasoli from Tuscany, M. de la Trehonnois of Paris, besides a gentleman from Switzerland, and another from Rotterdam. On the part of the society he heartily bade them welcome. Long might they or their compatriots attend these annual gatherings, and long might that bond of union which existed between us be more and more strengthened by the cultivation of the arts of peace (applause).

Baron Ricasoli, in reply, delivered a long and eloquent address in Italian, which was very patiently listened to by an audience which, unfortunately, knew but little of what he was saying.

Sir H. Maxwell returned thanks for the Navy, and the Duke of Cleveland for the Army in a very lengthy address, which his Grace concluded by proposing "The Royal Agricultural Society of England." (Drunk with all the honours.)

Lord Berners' privilege on this occasion was to offer for their acceptance a toast which he was perfectly satisfied would be received with as much gratification to the company as it was a pleasure to him to propose it; it was the health of Mr. Miles, who so worthily filled the chair. (cheers.) He knew there was no one who had watched his conduct in the senate, or of those who had had the pleasure of being in his neighbourhood and

had watched him in the performance of his duty as a country gentleman, that would not bear testimony that there was no one who stood higher for honesty, for straightforward and high-principled bearing. He had to congratulate his honourable friend and the meeting on the successful termination of his career as president of this society. This he knew, that all the presidents that they had had, they had never had one who devoted more of his time and more of his attention to the interests of the society. Their president was one, he need not tell them, who was an ardent lover of agriculture, and a successful practical farmer. But he was one of those who knew, and who practised in their conduct, that though he supported the cause of agriculture, and knew that the prosperity of England depended on agriculture, it did not entirely depend on it. He had known the Chairman from his boyhood, and he knew him to be one of those who had ever attempted, and successfully attempted, to unite in stronger bonds of union landlord, tenant, and labourer (cheers). He was informed this was the best meeting the Society had ever held, and in fact the assembly he saw before him proved that it had been most successful. The sterling character of the implements shown, the beauty and symmetry of the stock, the increased improvement that they saw in the show of horses—all this showed that the objects of the Society had been successfully carried out under the able presidency of his honourable friend (cheers). He concluded by proposing the health of the President (loud cheers). (Drunk with all the honours).

The PRESIDENT in responding to the compliment said: It was indeed an honour to him to preside, at he might say the limits of England, over one of the largest assemblies which he ever remembered to have greeted their annual festivities. It was with pride and satisfaction that he looked to the result of this meeting; that he saw cattle from the west, cattle from the midland counties, cattle from Scotland, cattle from Cumberland, sheep and pigs, all ready to compete —one end of the country with another—and to show at any rate that if a good race exists in one, another, and in all probability a better one to encounter the rigours of the north, exists in that part of the country in which they were now assembled (cheers). He congratulated them, not only on the aspect of the animals, and their high qualities, but he congratulated them likewise on the implement show; for although possibly they had not had the same number of implements collected together at Carlisle, yet he would tell them this, that they had made up in quality, possibly, what they wanted in quantity (cheers); and that he never saw in his life, in any number of implements placed before his eyes, so few that could receive any kind of comment whatever inimical to the person who made them. Having been a member of this Society from its commencement, he could not but see the good it had steadily done throughout the country; and when he recollected the state of agriculture eighteen or twenty years ago, and compared it with its present state, he could not but congratulate the agricultural world, not only on this improvement, but on what he conceived to be its thriving prospects. When he recollected passing through the country—and he was somewhat of a traveller in his native land—and looking right and left, twenty years ago, though there was much good farming throughout the land, yet it was rather the exception than the rule. He thought that now it was speedily becoming the rule, and that they avoided the bad farmer nearly as much as they avoided the cholera. But what had this been owing to? Why, if they would look first of all to the difference of the cleanliness of the land—if they were to look at the operation which now takes place in almost every county, namely, the autumn cleansing of stubbles—if they were to look, at the same time, to the immense quantities of artificial manures now used, he thought they would see cause to congratulate themselves as husbandmen of the land; and at the same time, if they could be convinced that the large outlay would give additional crops, they were the last men to grudge the additional outlay. Just before he left London a parliamentary paper was put into his hands, which indicated the extraordinary results that had taken place in the imports of one artificial manure—guano; and that result was so extraordinary during the last fourteen years, that he could not help stating the immense increase that had taken place in the case of that manure, and the vast sum which the agriculturists of Great Britain annually laid out upon it. He found that in 1841 there were imported into this country 2,881 tons, whereas in the year last passed (1854) there were imported into this country 235,111 tons; so that, taking the guano at £10 an acre, which was a fair average—and he was quite sure that many farmers paid much more—he found that in the former period only £28,810 was expended in that material, whereas, fourteen years afterwards, £2,351,110 was spent in that artificial manure alone. And though they had no way of testing other artificials—because, excepting the nitrates, they did not enter into our importation returns—yet he had the satisfaction of stating that the nitrates had doubled. But, as they were used for other purposes besides agriculture, they could found no argument on that. Whilst at the same time they had been using other artificial manures equally with guano; and when they looked at the immense quantities of bones used in the manufacture of superphosphate of lime, they would find that, whereas 14 years ago they only laid out £1 per acre, they now at this time laid out 30s. or 35s. per acre on artificial manure alone. How had this been done? What had led to this wonderful stimulus to agriculture? Why, according to his views, it had taken place in this way: by these large societies meeting annually, as they did, in every part of the country, co-mingling together not as agriculturists alone, but as manufacturers, commercial men, agriculturists, feeders of cattle, and implement-makers—each brought something into the general treasury; and aided, as they were, by their excellent *Journal*, which disseminated, he trusted and hoped, most useful knowledge throughout the community, information respecting those artificial manures was communicated to those who before probably trusted to manures of their own creating—and nothing could be better if only created in greater quantity—(laughter)—

but wanting the greater quantity, they must have recourse to artificial manures. He said these meetings, these publications, whether proceeding from this society or the Scotch society, had set men's minds a-thinking; and the result had been better agriculture, and more food for the thousands and millions of our people (cheers). While he was on the subject of the *Journal*, let him express one feeling of regret for him whom they had lately lost, an old friend of his own—one who for sixteen years conducted, as editor, the *Journal of the Royal Agricultural Society*; who to much and accurate judgment added scientific and mechanical research, and a mildness of manner admired by all; who twice a year placed before the public that *Journal* of which they were proud; who, himself commencing merely as a scientific farmer, became one of the best of practical farmers—(Hear, hear)—and, might he say, while he expressed his own regret for his early loss, that this meeting indeed condoled with his family, and that while the English Agricultural Society existed the name of Philip Pusey would be always recollected (great cheering)? They regretted his loss—and thanks, ten thousand thanks, for what he had done on behalf of this society (cheers). His hon. friend alluded in his speech to what he (the President) could not easily pass over, and that was the visit which he, as President of this society, with the secretary, professors, and six renting farmers, paid by invitation to the city of Paris. He might say they were received with the very greatest kindness, that everything was open to them, that they had an opportunity there of seeing the cattle of different nations, that they had likewise the pleasure of seeing all the prizes distributed; and when they recollected the success which Englishmen had there, he thought they should be proud indeed of the position they held as breeders of cattle of eminently good qualities (applause). But after the splendid gifts bestowed by the Emperor, it would be almost impossible to vie with their French friends, and when they came out with their programme the next two succeeding years, he only hoped the English agriculturists would be as successful as they had been on this occasion. He could not but allude to one who had been pre-eminently successful; he alluded to Mr. Jonas Webb, the successful breeder of Southdowns (cheers). He gained the first prize, and every other animal he showed had a ticket of merit; while the merit of the whole of his stock was thought so great that a special medal had been ordered to be struck off in commemoration of his services at the Exhibition, and for having at the same time the very largest number of good cattle (cheers). This, he was sure, they would be glad to hear; he was glad from this place to state it: but Mr. Webb was not satisfied with what he had done, for, seeing he had been treated so well, like an English farmer he presented, and it was graciously accepted, the best ram, which had gained the prize, to the Emperor himself (loud applause). He (the President) was associated in Paris with the Scotch and Irish societies. He was happy to say their union was complete, and that before they quitted Paris they addressed the Emperor, through Lord Cowley, sorry that they could not all remain there to wait his pleasure to present that address. They felt themselves as twin sisters. They were all endeavouring as much as possible to gain the same end, viz., that of promoting the agriculture of their respective countries, assured that while they did that they were at the same time promoting the prosperity of the whole of Great Britain (applause). Before sitting down he begged again to thank them for the honour they had done him, and to give them as a toast "The Royal Agricultural Societies of Scotland and Ireland," coupling with it the names of Mr. Alexander Graham and Captain Ball.

Captain BALL returned thanks. This was not the first time by several that the Irish and the English Societies had fraternized. They had had on numerous occasions the pleasure and advantage of seeing distinguished members of the English Society attending their meetings in Ireland, to see the system of farming there and give them the benefit of their advice, and he had frequently had the pleasure of attending the meetings here. But it had been reserved for the Emperor of the French to inaugurate the system of international shows, which would have the effect of drawing closer the bonds of union between the two great kingdoms. The three societies had sent separate deputations to Paris, totally unconnected with each other. They had gone there without any intention of acting together until they arrived in France, where they found, what was really the case, that they were regarded as the same people. In fact, their interests were identical; and no matter whether they farmed in Ireland, in the fens of Lincolnshire, or in the Highlands of Scotland, they were acting in one common cause.

Sir JOHN MAXWELL said he was afraid it spoke little for the maternal solicitude which the Society of Scotland should have for her "eldest bairn," that the gentleman deputed to return thanks for that society was not present. His friend, Mr. Hobbs, told him to-day, as he drove him through the storm to the dinner, that their child was nearly of age; but as long as it was *in statu pupillari*, they must show that parental solicitude for her which an affectionate parent always had for her child. As a member of the Highland Agricultural Society, he had got permission from their president to return thanks, and more especially considering the locality in which the Royal Agricultural Society of England was now assembled, namely the border. As a border laird, and one of the warders on the border—his right hon. friend Sir J. Graham being a warder on the other side—he felt most peculiar satisfaction in congratulating both countries on the success of their meeting. There was a time—that time, he was happy to say, was now gone by—when these two warders would not have been so happy to meet as now, and when raids between Netherby and Sprinkell were not such amicable matters as they are now (laughter). They had heard and could descant at agricultural meetings on the benefits of cross-breeding. They felt that in Scotland, and wished to have a little more cross-breeding between Scotland and England. They wanted more of the bonnie lassies of England to cross the border—he did not mean to rest at a pretty little village which many were acquainted with,

Gretna Green—but he should be happy as a border laird to give them every welcome; and he assured them the further they proceeded into Scotland the more warmly would they be welcomed. He was happy to hear that this was the most successful meeting the Agricultural Society of England had ever held. He trusted that after they had gone their round they would return to the borders; and he would assure them that they would receive the same hearty welcome, and if possible a more hearty reception than they had already experienced by the people of Scotland (cheers).

Mr. THOMPSON had been requested by the Chairman to propose a toast which only required to be named to ensure its meeting with a hearty reception—the Mayor and Corporation of Carlisle (cheers). The Mayor and the late Mayor had both taken considerable pains to bring about this meeting of the Royal Agricultural Society. If history spoke true, there had been times when Carlisle would not have been so well pleased to see an encampment so near to her walls. The society had not only invaded the town, but it had seized a material guarantee; it had provisioned its camp by bringing into it a goodly store of cattle of the most approved kind; and it had sent forth its implements to trench around the city (laughter). The meeting of the Royal Agricultural Society was always attended with considerable danger as well as benefit. It had the effect of bringing together the active and intelligent representatives of the public press, through whom the description of the exhibition was disseminated throughout the land. If, therefore, there was any little hole in the coats of the people of Carlisle, it was their own faults if it became known by their inviting the Royal Agricultural Society (a laugh). It was many years since he had been in Cumberland before, and he could only say that the improvement which had taken place was as astonishing as it was gratifying. They had done much in the way of draining, and, although he did not think they had finished, they had done enough to show the benefits that had arisen from it. But their green crops had made him break one of the ten commandments (laughter). He was a farmer in a district (Yorkshire) where they thought themselves pretty good farmers, and they thought that they knew pretty well how to grow turnips, but he must say Cumberland beat them (cheers). He did not knock under in assiduity and industry, but with him they had none of those refreshing showers which had fallen since they entered the pavilion (cheers and laughter). The climate, however, was very unfavourable for haymaking, and he did not know how the farmers here got their hay made. He thought they would be obliged to purchase waterproof seeds next (laughter). Returning to the toast, he spoke of the liberality of the Corporation. They had given them every facility in the way of lands and rooms, and the Mayor had gone further by contributing liberal prizes for stock (loud cheers).

The Mayor having duly responded, was followed by

Sir JAMES GRAHAM, who said: I have long anticipated the day when the Royal Agricultural Society would visit this northern border. We have long rejoiced in agriculture. We have endeavoured to promote it to the utmost of our ability, and I was anxious that the great Society over which you preside should witness our endeavours and encourage our exertions (cheers). Mr. Miles, I am, with you, one of the original members of this Society. Together with Lord Althorp, with the Duke of Richmond, and with other most distinguished friends of agriculture throughout the United Kingdom, I was anxious that a parent general society should be established, embracing the principles of the toast I am about to propose to you. That toast is Agriculture, Manufactures, and Commerce; and the principle contained in the toast—you will confirm me when I say—is the fundamental principle on which this Society is based (Hear, hear). It was not of an exclusive character. It was the great design of those who founded it that it should be inclusive to the utmost possible extent (cheers). Now, sir, it is part of the character of the English farmer that he is grateful for benefits received—(Hear, hear)—and I believe, although it is true what I say, that within the last twenty years the agriculture of England has made marked and extraordinary progress, yet we should be ungrateful in the extreme if, on an occasion such as this, we forgot those who went before us (cheers). I know not, but I believe I have the honour of speaking in the presence of one of the sons of the late Mr. Coke, of Norfolk; at all events I am speaking in the presence of those who remember the exertions of Mr. Curwen in the cause of agriculture. (Hear, hear.) The meetings at Holkham, and the meetings at Workington—the agricultural societies which were then formed, on the model of the first agricultural society established in England—the Bath and West of England Society, with which you, sir, are so honourably connected—did in their day the greatest possible good. But their efforts were desultory; they were local; they were imperfect; and it was our great object to establish one parent society which should centralise the good effects of all these disjointed assemblies, and should give the people of England the united benefit of one common parent association. (Hear, hear.) Now, sir, I will but in passing mention that, although we have done great things in the last twenty years, yet my belief is that the introduction of turnip husbandry, of drill husbandry, of the winter feeding of cattle, and of the penning of sheep on turnip land—that these were the great operations effected during the last twenty years in agriculture, and that they were to agriculture what mechanical power has been to trade, manufactures, and commerce—they were vital principles on which all agricultural improvement mainly depends. (Hear, hear.) We have advanced, but we were not the originators of this great agricultural improvement. Now, sir, I shall only, in passing, observe that I am rejoiced at what has been done within a more recent period. I felt particularly the allusion—the touching allusion—which you made to the memory of my departed friend, Mr. Pusey. I do not think it is possible to exaggerate his merits. The diffusion of knowledge, to which you have already referred, has been of the greatest possible advantage, and the *Journal of the Royal Agricultural Society*

was mainly conducted by Mr. Pusey, whose talents, whose patience, whose genius, whose unassuming manners, whose conciliatory demeanour, advanced to the greatest possible degree the success of this undertaking; and I sincerely hope that though we have lost Mr. Pusey, it will be among the first objects of the Royal Agricultural Society to continue the *Journal*, and maintain open that fountain of agricultural knowledge and useful information which, like irrigation well conducted, carries in a thousand different channels those little rills of information which invigorate every herb and root which they touch, and fertilize while they flow, giving to each valley plenty and abundance, and rendering the culture of this country universal and perfect (cheers). I have already touched upon some of the advantages which we in the north derive from your visit. Our knowledge of improved machinery has hitherto not reached that point which I think is desirable. In the present circumstances of this country, emigration being so extensive, the demand for the sister services, the army and navy, so very large—the calls on industry being so very great, it is obvious that the mechanical improvement, whereby manual labour is more or less superseded, is one of the sources of the diminution of the cost of production, and is therefore one of the direct roads to profit (cheers). I would not recommend tenant-farmers to try experiments with machinery. (Hear, hear.) It becomes one of their principal advantages, in attending the shows of a society like this, that they see approved machinery, which is tested by experience, and a guarantee of which will be found given to you in the results of the experience of the society. It would be invidious to mention particular implements, but I do believe that the moveable thrashing machine may be said to have been brought to perfection, and that it may be used in conjunction either with a locomotive or with horse-power. To small farmers, to whom it is not sufficiently advantageous to incur the expense of a fixed thrashing-machine, the portable engine may be used with advantage. I would call attention to another admirable implement, the clod-crusher, which has also, I think, been brought pretty nearly to perfection. On stiff clay soils, which are hard of cultivation, and least profitable when manual labour is applied to them, the clod-crusher is well worthy of notice. (Hear, hear.) There are other implements which are yet in their infancy. That mighty power steam will, I have no doubt, in the process of time, be made more and more available for the purposes of agriculture. I do not despair that it may be used even for ploughing, but more probably for draining with the aid of the plough; but these are experiments yet in the womb of time, and I would not venture so positively to recommend them. But, now that I have mentioned the power of steam, and the advantages of mechanical science not only to agriculture, but to manufactures, it is in immediate connection with the subject of my toast to point out how intimately connected, how closely and inseparably blended, agriculture and manufactures are (cheers). The same principle, the same knowledge which is the mainspring and life of the one, is, as I can show you, the moving power and the best security to the other (cheers). Let me illustrate this. My honourable friend, the chairman, has spoken of the immense increase in the quantity of guano used in this country. I remember the time when it was thought expedient to impose a heavy import-duty on wool. Consider what has happened. The duty on foreign wool has been entirely repealed, the imports from Australia year by year increasing, the imports from Germany increasing in a like proportion; and as the imports have increased, the demand for wool of the home-growth has increased: not in the same, but in an infinitely increased ratio (Hear, hear). By a dispensation of Providence, wise and beneficent, it would appear that all the countries of the earth can be made by the blessing of that superintending control subservient to the good and the advantage of each other (cheers). English wool, it is clearly ascertained, without a mixture of foreign and Australian wool, cannot be wrought into manufacture with profit and advantage such as that which attends the mixture. What is the consequence? You have imported largely from Germany and Australia; your manufacture is progressing; your profits have greatly increased; the demand for wool was never greater in England than it has been for the last three or four years, and the profits of sheep farmers, I am confident, were never higher (cheers). So much for the union of manufactures and agriculture. Now in this neighbourhood we are more practically conscious of this than perhaps any other neighbourhood in England. This district in which you now hold your assembly was at one time an importing district, not growing corn enough for the maintenance of its inhabitants. Now we provide food for Liverpool and Manchester. We export largely not only that which is the staff of life, but that which is the first luxury of life when trade is thriving. The first object of the artizan is to obtain meat of the best quality. We export largely to Manchester and Liverpool. The state of manufactures there is the index of our agricultural market. By practical experience we learn that without prosperity in manufactures, prosperity in agriculture cannot be hoped for, and cannot be maintained; and our knowledge is, therefore, intimate of the connection to which I have already alluded (cheers). Think of it as it relates to shipping and commerce. Think of the effect upon commerce of drawing the quantity of guano you, sir, have specified, from foreign countries to England during the last two years. Remember that that great and useful manure, which according to our practice is almost necessary for our green crops, which constitute the key to improved agriculture—remember that it is brought from the most remote corners of the world, from another hemisphere, from a distance of four months' voyage; think of wool brought from the opposite corner of the southern hemisphere by the shipping of England, and you will see the intimate connection between the commerce, the manufactures, and the agriculture of England, and that the toast which I recommend to your notice rests upon no theory, but upon the largest practical experience (cheers). Some allusion has been made to what I regard as a great misfortune. The peace which we enjoyed for forty years

has unhappily—as I say, necessarily, but still unhappily —been disturbed (Hear, hear). My earnest desire is that at the earliest period consistent with the honour of the country, peace should be restored (cheers). I do not hope for it except consistently with the honour of our country (great cheering). But whatever may be said with regard to peace abroad, I thank God I have lived to see the day when peace and concord are established at home (cheers). There is no longer a war of classes amongst ourselves. We meet as brethren living together in unity with each other, with a common interest established—no rival interests—no rival expectations; we are a united and a happy family (cheers). Agriculture, Manufactures, and Commerce: God has united them, and let not man ever again put them asunder (cheers). I have now the greatest pleasure in proposing to you a toast which Mr. Miles has confided to me: I beg to propose to you "Agriculture, Manufactures, and Commerce" (loud cheers).

The DEAN OF CARLISLE was glad to propose at such a meeting the health of the labouring classes (cheers). The noble lord who spoke a short time ago, inadvertently stated that the proceedings of the meeting were about to close that day; but in his (the Dean's) opinion, the most important day remained—to-morrow, when the exhibition would be open: every man in the county, and within fifty miles of this place, who could muster a shilling, would see presented to him the wonders of the show yard in its varied departments (cheers). From what he knew of the labouring classes, there was hardly a man who could command a shilling who would not be anxious to be present on this occasion (cheers). But, when called upon to give the labouring classes, it occurred to him that there was some inappropriateness in the name. They were all labouring classes. That was what knit them together (cheers). There was no man, whatever his rank, who had not his labour to perform. It was long since the edict went forth, that the man who would not work, neither let him eat; and it was one of the glories of this country that persons of all ranks in this country were glad to labour if thereby they could benefit their country and their fellow-men. That was one thing which united the labouring classes with all classes above them in this country. And there was another thing, which made them all feel as brothers: a man might rise from the lowest to the highest class in this country (Hear, hear). It was obvious that as no man could be a prosperous landlord who had not prosperous farmers, so neither could he be a prosperous farmer who had not prosperous, well-fed, well-housed, well-educated labourers (cheers). That feeling was growing in this country every day. The time was past, in this district, when farmers thought it was not their bounden duty in every way to promote the prosperity, both educational and every other kind, of the labourers with whom they had had to do (cheers). He trusted the benefit of meetings like this, which had brought us together, would be to cause them all to feel more united, the highest with the lowest labouring classes, all doing their best for the good of one another.

Sir STAFFORD H. NORTHCOTE, Bart., M.P., proposed "The Railway Companies, and thanks to them for their co-operation in promoting the objects of the Society." They had occasion to thank the railway companies for their steady, renewed, and ever-increasing attention, and the unshaken patience and assiduity with which they accomplished the important duties that had devolved upon them. The society had been again and again called upon to thank them for their arrangements, and in fact he believed he might truly say their very existence as an agricultural society depended upon the co-operation which they received from the railway companies (Hear, hear, and cheers). When they considered how much it was the object of this society to diffuse knowledge through the length and breadth of the land, by example as well as by precept—by exhibiting in one part after another, in places widely separated from each other, not only large quantities of heavy implements, but also cattle, which it would be impossible to drive on their feet, many of them, the five-hundredth part of the distance they had to go, without serious detriment to them and loss to those who sent them—when he considered all this, he thought he might say that the railways were essential to their existence; and as they had formerly given "commerce and ships," so he thought they might give very fairly "agriculture and railways" (applause). That the railway companies had been very liberal, there was no doubt; he hoped the meeting might be profitable also to the railways, for all should desire it to be to their mutual advantage, and he thought that if the railways brought their stock, the exhibition in return brought them profitable crowds of passengers (cheers and laughter).

Lieut.-Colonel HASELL having returned thanks, Colonel Challoner gave "The Stewards and Judges of the Show."

Mr. W. FISHER HOBBS, as senior steward, responded. Having had some experience as a breeder of stock, and also as adjudicator of prizes at various agricultural shows; having had some experience in the practical management of implements, and being also acquainted with the principal implement manufacturers throughout the country, he had watched with careful attention and great consideration the rapid progress which had been made in the exhibition of animals and implements at this meeting. He did not think there had been an exhibition of any society where the judges had been more anxious to discharge their duties properly, or where those duties had been so heavy, as on the present occasion. Although he had not had an opportunity of observing much of the agriculture of the district, still he had been very much surprised at not seeing more of drill husbandry, and more general economy practised by the use of machinery. He did hope and trust that the farmers of this district would take advantage of the opportunity of selecting from the implement catalogue some of the best machinery; for he was sure that in all parts of the kingdom which they had visited, where machinery had been introduced, it had been productive of very great advantage. In conclusion, he thanked them for the great kindness the society had met with in Carlisle, and said he should retire from its walls wishing the inhabitants many happy days, while he should always remember with pleasure the happy hours he had spent in "merry Carlisle" (cheers).

Mr. MARSHALL, M.P., briefly proposed the health of the president-elect, Lord Portman, who was unavoidably detained in London by his Parliamentary duties.

The dinner was supplied by Mr. Breach, of the County Hotel, Carlisle, and Mr. Higgs, of the London Tavern, discharged the duties of toast-master.

REPORTS ON THE STOCK CLASSES.

In presenting our readers with a consecutive analysis of the various stock classes, we think it will not be necessary to say a word relative to those particular breeds of cattle, horses, or sheep which have so long been favoured by the Society as to have annually the same amount of prizes offered for their improvement and perpetuation. Shorthorns, Herefords, and Devons are everywhere known, as are also Southdowns, Leicesters, and Longwools. The classes of horses have occasionally been varied, which may require a word or two on coming to them. The Clydesdale horse class is a new one for this meeting, to which we naturally give more especial notice. We will only here say that some splendid specimens of the breed were shown in each class; but, as comparative strangers to the breed, we were astonished to see the vast difference both in size and form of the various animals shown as Clydesdales—some of them very compact, well-formed, noble animals; again, others unusually tall, and by no means in good form.

The Scotch cattle also require more essential notice, not only on account of the prizes offered by the Society, but in commendation and justification of the truly-laudable offer made by Mr. G. H. Head, of £100 for an especial class of Galloway cattle, and which was admirably filled. These Scotch classes are also new, and may be considered as being in lieu of the usual local classes for which the Society annually offer prizes.

The new sheep classes also demand an extended notice. The various mountain sheep classes constituted a very interesting as well as most important portion of the stock exhibited. To these we confess ourselves comparative strangers, being chiefly conversant with them from an occasional visit to mountain scenery, and from seeing various specimens at our exhibition meetings, and sometimes in our markets. These occasions, however, have not sufficiently matured our judgment as to lead us to speak of them with any great degree of confidence. However, we were pleased to find that the judges awarded their prizes after the usual manner, *i. e.*, to the animals possessing the best form and proportions. To digress for one moment: A few days prior to the meeting, we were going over that most romantic part of Cumberland scenery known as "Borrowdale," *viâ* Gates-garth to Buttermere. At Gates-garth we instantly noticed an improvement in the general outline and character of the breed of sheep on the mountain-side. On inquiry we were told that "*they were Mr. Nelson's, and that he was the best breeder about here.*" We subsequently found some of these pretty little sheep in the show-yard, but without any distinguishing mark of approval. This confirmed us in our ideas that these valuable breeds were more approved of for their useful qualities than for their adaptation for climbing mountain sides.

SCOTCH CATTLE.

On former occasions the Society has provided a special class for developing local proficiency in cattle-breeding, and for bringing out the merits of breeds peculiar to the districts visited by our great annual concourse of agriculturists. At Windsor were added to the accustomed divisions of "Shorthorns," "Herefords," "Devons," and "Other Breeds," the new classes of Long-horns, Channel Islands, Sussex, Scotch horned, Scotch-polled, Welsh, Irish, &c. At Lewes was a Sussex Class, beside the usual one "For any other breeds;" at Gloucester a special class for the Welsh breed; and now at Carlisle for Scotch cattle.

The *Kyloes*, or West Highland cattle, are the prevailing breed in the Highlands and in the larger Hebrides, and are perfectly adapted to the cold, humid climate and coarse herbage of their native country. The true West Highland ox has short muscular limbs, a wide and deep chest, finely arched ribs, and straight back; his skin is thick, but mellow, and closely covered with shaggy hair; his head broad, with the muzzle short but fine; he has a bright full eye, long up-turned horns, and a bold erect carriage. Though slow in arriving at maturity, the Kyloe will ultimately fatten where the daintier Short-horn could barely exist; and his carcass is compact, and his beef of choice quality. The cows give very little milk.

The *Galloway* has a larger frame, adapting him to a lower range of pastures; but his qualities and general appearance are so similar to those of the West Highlander, that he has sometimes been called "a Kyloe without horns." He is of more docile and placid disposition, giving him greater aptitude to fatten. The Galloways have had to yield to the Short-horns in those parts of their native district where the turnip husbandry can be prosecuted to advantage; while the Ayrshires have justly supplanted them for the dairy; but in those parts where the rearing of grazing cattle is found the more suitable practice, they are still carefully preserved as a distinct and valuable breed.

There are several breeds of heavy cattle, some of them polled and some horned, and generally of a black colour, on the east coast of Scotland—as the

Aberdeen, the Angus, and the Fife; all of them possessing valuable qualities, and peculiar adaptation to their respective localities. But along with an improving arable husbandry has extended another style of cattle, namely, the Short-horns, rapidly displacing or amalgamating with the native breeds, all of which produce admirable crosses with the Short-horn.

The *Ayrshire* breed is celebrated for dairy purposes. From the pains which have been taken to develope their milking power, it is now of the highest order; so that no other breed can equal them in their native county and other similarly circumstanced localities, for the converting of poor or medium pasture into butter and cheese. They are, however, somewhat difficult to fatten, and their beef is of inferior quality; but when crossed with the Short-horns, they produce remarkably good grazing animals.

The colour of the Ayrshire breed is generally red and white in spots, not marbled like the Short-horns; sometimes white and black, sometimes altogether red or brown. The horns should be fine, twisting upwards; the face long, with a lively yet docile expression; the figure of the body enlarging from the fore to the hind quarters, broad across the loins; the back straight; the tail fine, long, and bushy at the extremity; the udder white and capacious, coming well forward on the belly; the teats of middle size, set equally, and wide apart from each other, and the milk veins prominent, and fully developed. The whole appearance of the animal should be sleek and thriving. Compared with the Short-horn, the Ayrshire is a small breed, weighing from 30 to 45 stones imperial.

MOUNTAIN SHEEP.

This class, forming the principal novelty among the sheep, demands a few general descriptive observations. The principal breeds represented are, the Cheviot, the Black-faced or Heath, and the Herdwick.

The *Cheviot* sheep, inhabiting the lofty range of hills of that name, is polled; with white face and legs; fine, short, close-set wool, weighing three or four pounds per fleece; and, when fat, weighs from sixteen to twenty pounds per quarter. The Cheviot has a tendency to lightness of the forequarter—the characteristic of a mountain sheep in its natural state—but has been greatly improved by judicious selection in breeding. Upon the lower sheep-walks, which are able to sustain a larger and less hardy animal, a cross with the Leicester has been found profitable; though no such improvement is possible upon the more bleak and stormy elevations.

The *Black-faced,* or *Heath* sheep, as it is called, to distinguish it from the *forest* breeds of England, is the prevailing breed upon the mountains of our northern counties and the highlands of Scotland, where the herbage is of the coarsest description; and, being a shorter animal than the Cheviot, the two varieties are known as "Short" and "Long" sheep. The face and legs of a Heath sheep are black or mottled; the ram's horns have two or more spiral twists, the ewe's horns smaller, and not twisted; the muzzle is long and clean; the eye full of life and fire; the ears moderately long. The carcass is round and firm, the chest wide, the ribs full. The wool is long, soft, open, thinly-set, and free from "kemps," or white wiry hairs, destitute of the felting property; so that it entirely differs from the fleece of other breeds inhabiting similar districts, which have generally a short, thickly-set staple. When fat, they weigh about sixteen pounds per quarter; though they have been exhibited more than double this weight. Their mutton has a venison-like flavour; and they have a very large quantity of loose tallow in them. Some highly improved specimens of this breed were shown at the Newcastle Meeting of the Society in 1846; and some valuable crosses with Leicester or Southdown rams have been produced in some localities, for which purpose the latter famous breeds have come into great request; but the pure Black-face alone is adapted to the wildest situations.

Of the Cumberland sheep, the *Herdwick* seems to be the best. It has a speckled face; no horns, if without intermixture of blood; and the wool is fine, though somewhat "kempy," assuming the appearance of hair, which is used for the coarsest manufacturing purposes, such as making horse-rugs. A singular anatomical character is also found in this breed, some individuals having an extra rib more than any other sheep, that is, fourteen, instead of thirteen. When fat, they weigh twelve pounds per quarter; and their flesh is of delicious quality. The wethers go off at four and a half to five and a half years old; the ewes are kept as long as they will breed, which is often until they are ten or fifteen years of age. The Herdwicks are remarkably hardy; they scrape a subsistence from the mountain heights through the sharpest winter, always gathering to the *most exposed* side, from which the snow has been partially blown away; and having no disposition to wander, like the Black-faced sheep.

CATTLE CLASSES.

The competition this year in the three most prominent and most favourite breeds of cattle was numerically about an average one. We have before us a table showing the various numbers of all classes

shown during the past nine years, which we give below. It will be seen that of Shorthorns the number exhibited, 98, was the exact average; as also, in the Hereford class, 32 is the exact average of the past nine years. The great number of Devons shown at Exeter, 124, compared with 23, as shown at Carlisle, makes the latter a sad falling off in point of numbers. These three classes we shall take first. They were exceedingly well sustained. A more splendid show of Shorthorns we believe we never saw—so uniformly good (with one or two exceptions only), and denoting not only all that beauty of colour, form, and feature which all so much admire and love to see, but those better and more substantial qualities —a large, rotund, proportionate frame, evidencing a tendency or capacity to produce plenty of good lean flesh, and of the primest quality, as well as to lay on, as they do, such enormous quantities of fat. This is as it should be: who can dine from off fat meat? We are glad to notice such a feature at this meeting. We think more attention is given to the breeding of animals of heavier frame, and denoting a tendency or propensity to produce good lean flesh, than heretofore. For the public good, we beg most earnestly still closer attention to this principle in breeding, in every class.

The Hereford classes, as we have said, are in average number; we think, also, in average quality. We have never seen a much better Hereford bull than Lord Berwick's; and many other animals in these classes possess extraordinary merit. If they do not equal the Shorthorns as a breed of cattle, they are at least next in public favour to them; and now and then we see single specimens of the breed almost unequalled in size and quality. As a breed, they are perhaps second to none in arriving at a profitable maturity under disadvantageous pasturage. They seem well adapted for sweet pasturage, of moderate quality, upon which they thrive faster than the Shorthorns; but in their thrifty growth under all circumstances, they are inferior to them. They possess great beauty of colour and frame, and are exceedingly good graziers and milkers. We hope they will be long perpetuated and improved.

The Devon classes are much under the usual average, 23 animals only being shown, whereas the average of the past nine years is 51. Neither are there many animals of great merit amongst them. They possess qualities undeniably great; every ounce of flesh appears adapted for roasting, small in proportions, perfect in symmetry, and admirably adapted for fatting on inferior pasturage: but, much as we admire their frame and beauty, we cannot think them a very profitable breed. We should, however, be sorry to miss them. Why they should have as much money allotted to them in prizes as the Shorthorn classes, is a problem yet to be solved, and that deserves the serious consideration of the Council.

The comparative progress of the cattle classes, in number of animals exhibited from year to year, appears at one view in the following table, which we have extended back to the Northampton meeting in 1847:

Meeting.	Short-horns.	Here-fords.	Devons	Other breeds	Extra stock.	Total beasts.
Northampton.	92	35	28	10	9	174
York.....	105	30	30	8	13	186
Norwich	95	28	48	35	4	210
Exeter.....	68	25	124	16	5	236
Windsor	176	41	74	94	0	385
Lewes	64	29	38	92	0	223
Gloucester ..	75	43	55	20	0	193
Lincoln	111	29	41	17	0	198
Carlisle	98	32	23	0	19*	172
Average number at one show.....	98	32	51	32	6	219

* Ayrshire, 12; Angus, &c., 4; Highland, &c., 3.

In going over the various classes, with the view of drawing up a consecutive analysis of them, it should be understood that it is not professed to give a description of every animal, but merely to call attention to those animals, with their most prominent points, which fell under actual notice. Our object is to place before the public, as prominently and favourably as we can, the names of our various breeders who confer such lasting benefits upon the community, with a most concise notice of the animals they exhibit. We take the classes in rotation, according to catalogue; which having published in the last supplement, we shall merely give here the numbers and names.

SHORT HORNS.

CLASS I.—*Bulls calved previously to 1st July, 1853, and not exceeding 4 years old.*

No. 3. Mr. T. G. Wilson's bull "Speculation" (12135) 2 years 2 months, is a well-made animal, fine head and neck, level back, deep form, but ribs not enough thrown out; thighs and twist full and good; tuts and tail rather low.

No. 4. Lord Feversham's "Gloucester" is only 2 years and 2 months old, but he possesses all the full outline of maturity, his colour is a good red and white, he has a fine head, neck, and horns; girth full, and chest all you can desire, a level broad back, ribs standing well out, broad loin, good hips, but rather prominent; sides deep and full, rump and thighs good, but flank, twist, and tuts, rather light; the general form and proportions cylindrical and true. He was bred by the late Earl Ducie, and obtained the second prize of £15.

No. 5. Lord Feversham's "5th Duke of Oxford," 2 years 3 months old. His colour is red and white; he has a fair frame and top, and denotes much good lean flesh; his girth somewhat defective, but he has a good level back.

No. 7. Mr. H. Ambler's bull "Grand Turk," 2 years

6 months old (12969), is a noble animal, a good roan colour, having a deep chest and full shoulders, head fine, neck fine and rather long, level back, good wide form and deep; his legs stand somewhat too near. He was highly commended.

No. 8. Mr. R. Booth's bull "Windsor," 3 years and 9 months old, is a splendid animal, having all his proportions in good outline; his colour white; he is very cylindrical in form, but if anything of better than cylindrical form, being deeper in frame than circumference. His head is rather plain, and horns wide, but his eye is fine; his back is admirably formed, level and broad throughout; his chest is full, and breast prominent; his shoulder and ribs well out, full plait, deep flank, long rump, and thigh deep, twist very good. First prize of £30.

No. 9. Messrs. Dixon and Fairlough's bull "Sultan," 2 years 4 months 10 days, is a roan, and well formed throughout; he has a deep chest, and fair chine, but his ribs not sufficiently springing; hips fair, and thigh deep, but his twist too narrow.

No. 10. Mr. W. Jackson's bull "The Count," 2 years 11 months. Deep chest, but ribs not sufficiently springing; his frame is deep, but too narrow, hips round, neck rather ill-formed.

No. 13. Mr. T. Chrisp's bull "Mainfred" (11767), red, 3 years 6 months, has a very deep well-formed frame, neck not full, chest deep and full, chine not first-rate, legs short, hips wide and round, back level, thighs deep, good and heavy.

No. 14. Mr. C. Towneley's bull "Voltigeur," red, 2 years 6 months 8 days, has a very good frame, perhaps a little too compact, a short neck and full chine, full flank, plait, and out shoulder full, thighs deep, hips rather narrow, but standing well; he denotes good lean flesh. Highly commended.

No. 17. Mr. W. Fletcher's bull "Champion," roan, 3 years 3 months 2 weeks 6 days. He has a very heavy fore-quarter, and as a whole possesses a good frame, but his hind-quarters are defective; his ribs not out enough, nor close enough to hip. Commended.

No. 18. Mr. J. Cartmell's bull "The Sheriff," red and white, 3 years 3 months 3 weeks. He has a beautiful head and horns, very deep form throughout, level broad back, and hips rather round, deep chest, but ribs rather too close in; he stands high, and is a fine animal. Commended.

CLASS II.—*Bulls calved since 1st July, 1853, and more than 1 year old.*

No. 24. Mr. S. Marjoribanks' bull "Panmure," roan, 1 year and 2 months. This is a well-formed, well got-up animal. He is very pretty-looking, with good tuts, and tail stands well; horns rather coarse, and standing out.

No. 25. Mr. S. Marjoribanks' bull "Jock o' Hazledean," white, 1 year and 2 months. His frame is good, but rather long; has a good head and neck, and nice hip and loin.

No. 26. The Earl of Burlington's bull "Prince of Gloucester," roan, 1 year and 2½ months. He denotes breeding of a high order, but his frame is rather long, and not sufficiently filled out.

No. 31. Mr. C. Towneley's bull "Master Butterfly," roan, 1 year and 11 months. His colour is very good. He has a beautiful, well-formed head and muzzle, and fine eye and horns; his form that of an oblong cylinder, of considerable length, and well proportioned; his back is broad, level, and fat; loin unusually broad and full; rump long and full; deep thighs, and full twist and flank; chine full, and ribs well-springing; chest round and full, breast-end well out; his girth well rounded, and good. He took the first prize at Lincoln last year as a bull calf; he now takes the first prize of £25.

No. 32. Mr. C. Towneley's bull "Richard Cœur de Lion," roan, 1 year and 7 months. This is a beautiful bull, with compact frame, and abundance of good points. His head, neck, and loins are good, level back, and fair hips (but not prominent), and rump full; thighs and flank deep, and full; chest stands well out; good shoulders, and arms well out. Highly commended.

No. 33. Mr. F. Fowler's bull "Duke of Bedford," 1 year and 10¾ months. This is a fair-made animal, deep in frame, good chest, and arms well out; wide outstanding horns, and sharp. Commended.

No. 34. Lord Berner's bull "Admiral," 1 year and 1 month. This is a nice little fair-formed animal, of good roan colour.

No. 35. Mr. F. H. Fawkes' roan bull "John o' Groat," 1 year and 5 months, is of good points and fine proportions. His form is good and symmetrical, with very even back and neat head; but his ribs are not sufficiently shown out; his hips are somewhat too narrow, short rump, and tail stands rather high; hand very good. Second prize of £15.

No. 36. Sir M. W. Ridley's bull "Comus," 1 year and 9 months. This is a fair-made and very useful animal, with good chest, chine, and girth; he reminds us of the Teeswater blood, on looking at his head.

CLASS III.—*Bull Calves, above 6 and under 12 months old.*

No. 37. Viscount Hill's bull calf "Hotspur," 11 months. This is a very pretty roan, and a compact little fellow; his horns are rather awkwardly set up. Commended; and he is worthy of it.

No. 44. Mr. R. Jefferson's bull calf "Cherry Duke," 6 months and 1 day. This is a beautiful calf, well-formed, and in good proportion; his ribs not enough out; form very cylindrical. Commended.

No. 45. Mr. C. Towneley's bull calf "Musician," 9 months. A beautiful white calf, of good size, very fat, and of considerable length. We thought his general frame too narrow; the head not fine; but, as a whole, a good animal. Third prize of £5.

No. 46. Mr. H. Ambler's bull calf, "Sir Colin Campbell," roan, 7 months. This is a beautiful little fellow; a very level back, and well formed; the chine rather narrow, and girth not full.

No. 48. Mr. M. Sanday's bull calf, "His Highness," white, 9 months. He possesses some very good points; but, as a whole, of fair make and proper proportions.

These three classes of bulls were admirably represented, and augur well for our further breeding. We could have pointed out one or two animals we should have wished away, but taking the three classes collectively, a better display of short-horn bulls has seldom been seen together.

CLASS IV.—*Cows in-milk or in-calf.*

No. 49. Mr. R. Stratton's "3rd Duchess of Gloucester," roan, 4 years 3 months. We do not know how to characterise animals like many in this class by single epithets. Let us say that this cow is an exceedingly fine animal; her head and horn fine and pleasant-looking; her neck, chine, and the springing of her ribs all you can wish for; her broad cylindrical frame nearly perfect as to symmetry; her hips not enormously large and prominent, but wide and proportionate; her rump, tuts, and twist very good; her chest and bosom were broad, deep, and full, and her girth surprising. This is what we might repeat over and over again throughout

the class, for many similar animals of great beauty and proportions are to be found. Good as she was, she was only commended.

No. 50. Mr. R. Stratton's cow, "Matchless the 2nd," roan, 4 years 5 months. Perhaps in some points this cow may be inferior to her fellow; but her hips are better, being well out and natural; her tail is rather low set on, but her frame and proportions are quite first-rate. Mr. Stratton may be proud of his two cows. This animal was also commended.

No. 52. Mr. James Douglas's cow, "Rose of Summer," 3 years 2 months, red. We have a full recollection of her, as *the incalved heifer*, at the Lincoln meeting; she has greatly improved, but is still scarcely noble enough in her general outline, almost perfect in form and proportion as she is. We should have liked her better if she had stood somewhat higher. Her deep rotundity of frame is admirable, and the excellent quality of flesh she denotes is equalled only by the best Devons; her chine and back, her springing rib, and broad natural hips are seldom surpassed. She was this year beaten by Mr. Booth's "Bridesmaid;" but took the second prize of £10.

No. 53. Mr. T. Moorhouse's cow, 5 years 3 months 10 days, roan. A deeply formed cow, with plenty of good hair; chine rather narrow, and loin thin, but broad good natural hips; and denoting in her general character a great tendency to produce lean flesh. Commended.

No. 54. Mr. H. Ambler's cow, "Rosamond," white, 7 years 6 months. This cow is very fat; she is a fine-formed animal, of great length and depth of frame; hips rather round and high, tuts broad, thigh deep and full; the largest in her class.

No. 55. Mr. R. Booth's cow, "Bridesmaid," roan, 4 years 4 months. We are again at a loss to characterise this cow; her frame is beautifully symmetrical, an animated cylinder of deep and surpassing proportions. Her deep frame, broad hips, back and loin of level outline; her large, fat, rather long rump and broad tuts are exceedingly good; perhaps her thighs are a little defective, but her chest and bosom amply compensate. First prize of £20.

No. 56. Mr. Jno. Booth's cow "Venus Victrix," roan, 5 years 10 months. This cow is in exceedingly good form; her back broad and level, and ribs well set out; her neck and chine rather thin and narrow.—Highly commended.

Class V.—*Heifers in-milk or in-calf, not exceeding 3 years old.*

No. 59. Mr. R. Stratton's heifer "Salth or Rose 3rd," roan, 2 years 4 months. She has a very compact frame; thick and good; tuts well-formed; good thighs, and deep make throughout. Commended.

No. 65. Mr. C. Towneley's heifer "Roan Duchess 2nd," roan, 2 years 9 months. She has an extraordinary back—wide and full throughout; head handsome, and horns fine, and fine in offal; her rump and tuts good, but tail a little elevated; her hip not wide, but her flank, twist, thigh, chest, and breast exceedingly good; her form highly symmetrical. First prize of £15.

No. 66. Mr. C. Towneley's heifer "Blanche 6th," red and white, 2 years and 10 months. This is also a truly good heifer, with breast, chine, and shoulders all you can desire; her cylindrical frame compact and full throughout; her tuts large, but her thighs and twist not well filled out; head and horns in fine outline, and handsome. Highly commended.

No. 70. Mr. G. Sainsbury's heifer "Duchess of Oxford," red and white, 2 years and 7 months, is a well-made good "lean-meated" heifer; frame long and good.

No. 72. Mr. R. Booth's heifer "Bride Elect," 2 years and 3 months, white. Her quality of flesh is admirable; beautiful head and horns; breast full; shoulder, chine, and girth capital; back level, and ribs well thrown out; hips not wide, but her twist and thighs good, and tuts large. Second prize of £10.

Class VI.—*Yearling Heifers.*

Nos. 73, 74, and 75. Viscount Hill's yearling heifers "Humble," "Handbell," and "Heresy," are three very good and well-formed heifers, well-worthy to be shown in this class. "Heresy" was commended.

No. 76. Mr. Stratton's heifer "Marcia 3rd," roan, 1 year and 6 months. She is of deeper frame than the preceding, and has many good points. Commended.

No. 79. Mr. J. S. Crawley's heifer "Gretna," roan, 1 year 5 months 8 days, is very cylindrical in frame; her horns too thick. Commended.

No. 81. Mr. Jno. Hall's heifer "Canney" roan, 1 year and 9 months. This is a very compactly-formed animal; chine, chest, and breast wide and full; ribs springing; full thighs, twist, and flank; girth good; head, neck, and muzzle, all good; hips not wide enough. First prize of £10.

Nos. 82, 83, 84, and 85. Mr. S. Marjoribank's heifers "Matchless," "Heedless," "Mayfly," and "Sunflower." These are four very complete little heifers—well-formed and not disguised by over-feeding. If we mistake not, we think we overheard them offered for sale to a foreign gentleman, together with another, for 500 guineas. No. 85 was commended.

No. 86. Mr. J. Douglas' heifer "Eva," red and white, 1 year and 2 weeks. Beautiful frame, but too small; back level; frame broad and symmetrical throughout.

No. 90. Mr. C. Towneley's heifer "Vestris 3rd," white, 1 year and 3 months, is a capital heifer, and very cylindrical shape; her breast-plates, flank, and twist deep and good; her tuts and tail drooping a little; her lean fleshy parts exceedingly good; fine waxy horn; good head. Second prize of £5.

No. 91. Mr. C. Towneley's heifer "Victoria," red roan, 1 year and 8 months, is a large, well-formed heifer; her back is not quite even, nor is her girth quite right. She has a deep long frame, a long rump, and good hips, tuts, and twist. Highly commended.

No. 93. Mr. W. Fletcher's heifer "Laura," white, 1 year 6 months and 3 weeks. She is a rather short, but very compact heifer; rump long, and very good hips, rather narrow; capital girth, thighs, and flank. Highly commended.

No. 98. Mr. S. Sainsbury's heifer "Little Flirt," red and white, 1 year and 4 months, is a well-made little heifer, and was very properly *commended*.

We have been more particular in going over these classes, and have devoted more time in their examination than we can bestow upon anything else in the yard; it is because we judged them to be of surpassing excellence. We are confirmed in this opinion by the awards of the judges, for, in addition to the usual prizes, they have conferred no less than seven *high commendations* and *fourteen commendations*. Two high commendations and five commendations were given in the Yearling Heifer Class; proving the high estimation in which that class was held by them. For ourselves, though coinciding with them in a great degree, we must

say, we think other classes equally deserving, and should have commended the whole classes generally.

HEREFORDS.

We must limit our remarks in the following classes to some of the most prominent animals, and that in a very brief form.

CLASS I.—*Bulls calved previously to the 1st July, 1853, and not exceeding 4 years old.*

No. 99. Mr. W. S. Powell's bull "Brecon," red-brown, with white face, 2 years and 7 months old, is a deep-chested, well-framed bull. He has very good thighs, and twist long and broad, a good chine, but ribs flat, not springing out from back. Hips and rump defective. Highly commended.

No. 100. Mr. W. Perry's bull "Goldfinder 2nd," red-brown, white face, is a heavily-loaded bull, and fat. Ribs not out, and girth defective. He is of deep frame, but too narrow; capital head, high neck, heavy thighs and twist, tuts bad.

No. 102. The Earl of Radnor's bull "Carlisle," red and white face, 2 years and 9 months old, is a deeply-formed, handsome bull, but not large. He is of excellent quality; very cylindrical, or rather oval form; deep, but not wide hips; narrow thighs; full, fair rump; but ribs flat; good flank. Second prize, £15.

No. 103. Mr. R. Hill's bull "Restorative," grey, 3 years and 5 months old. This is a heavy, well-made, good animal. Highly commended.

No. 105. Lord Berwick's bull "Attingham," red, white face, 2 years 9 months and 26 days old. This is a superb animal. He is high enough, is well formed, and cylindrically shaped, deep, and good throughout. Good girth and chest, level back, and broad; but ribs, thighs, and twist not quite corresponding. Extraordinary flank, long and good; frame long, full, and noble; head and neck commanding. We incline to class him as the best bull in the yard—such uniform depth and substance, and offal very fine. First prize of £30.

No. 106. Mr. J. Monkhouse's bull "Madoc," red, white face, 3 years and 6 months old. This is considerably smaller, but has a good frame, and is of excellent quality. Highly commended.

CLASS II.—*Bulls calved since 1st July, 1853, and more than 1 year old.*

No. 109. Lord Berwick's bull, red, white face, 1 year 9 months and 16 days old. He is very compact and well formed; deep and level frame, hips wide, rump good, flank deep, breast rather short, girth good, ribs deep, but not springing enough, of first-rate quality of flesh and good looks. First prize of £25.

No. 110. Mr. J. Monkhouse's bull "Columbus," red, with grey back and white face, 1 year and 7 months old. He has a fair form, pretty good hips and rump, and fair girth; ribs not springing. Only just entitled to second prize, £15.

CLASS III.—*Bull-calves, above 6 and under 12 months old.*

No. 112. Mr. E. Williams's bull-calf "Radnor," brown, 9 months and 1 week old. This is a beautiful little animal, denoting good expansion in his fore-quarters. Hips too close, and tail too high. Prize of £5. A short entry, but good specimens.

CLASS 4.—*Cows in Milk or in Calf.*

No. 118. Mr. J. Acker's cow "Beauty," light red, and white face, 5 years 8 months 11 days old. She is deeply formed, shoulder well out, hips good and full, tuts very fat, thighs rather thin. Her calf looks sadly. Commended.

No. 121. Mr. P. Turner's cow "Novice," red and white face, 3 years and 9 months. This is a very handsome and compact animal, beautifully symmetrical, but small; in quality all you can ask for. Second prize of £10.

No. 122. Mr. J. Monkhouse's cow "Winifred," red with white face, 10 years and 7 months. This is a large cow, with extraordinary hips and tuts, which takes away the appearance of a very good loin; shoulder and girth very good and full; full breast, prominent, and deep; a very profitable large cow. First prize of £20.

CLASS V.—*Heifers in-milk or in-calf, not exceeding 3 years old.*

No. 123. Mr. W. Perry's heifer, dark red, with face, 2 years 8 months and 18 days. This is a very pretty, but rather thinly-formed animal, and light-fleshed; rump, thighs, and twist thin; denotes a good milker. Second prize of £10.

No. 124. Mr. J. Walker's heifer "Lady Lincoln," red with white face, 2 years and 8 months. This is a very complete cylindrical frame, except a full hip and heavy tut; twist defective; stands very wide. First prize of £15.

CLASS VI.—*Yearling heifers.*

No. 125. Mr. W. Maybery's heifer "Zoe," red and white, 1 year 11 months and 12 days. This is exceedingly well-formed; a very straight back, and full; her under-parts very good; breast-plait, flank, thigh, twist, all good; neck thin; head rather large. Second prize of £5.

Nos. 126 and 127. Mr. E. Price's heifers, "Primrose" and "Silver," are two admirable specimens of the breed, but too light in frame and substance.

No. 128. Lord Berwick's heifer, 1 year and 4 months. This is another very prime little heifer, beautifully symmetrical throughout, very handsome: she stands too near, or legs and arms not out enough. First prize of £10.

Nos. 129 and 130. Mr. W. Raester's heifers, "Miss David" and "Miss David Chance," are very pretty specimens of the breed, but the last-named has a very long rump, almost projecting out of proportion.

Classes I. and VI. were generally commended.

DEVONS.

CLASS I.—*Bulls calved previously to the 1st July, 1853, and not exceeding 4 years old.*

No. 131. Mr. W. Hole's bull "Rob Roy," red, 2 years and 7 months. This is of beautiful quality, but not compact enough; frame too long in proportion.

No. 132. Mr. W. Farthing's bull "Duke of Somerset," red, 3 years and 2½ months. This bull has a very singular twist, overhanging so much as to form a defect in shape; very deep good form, and level flank, really hanging breast, deep and fat; long in frame. Commended.

No. 133. Mr. James Quartley's bull "Duke of Wellington," red, 3 years and 7 months. He has a very level, beautiful form; a very deep chest; chine is good, but the ribs do not spring out sufficiently from it to form a perfect cylinder, though of good shape; tuts are bad, and tail low; twist fair; quality of animal good. Second prize of £15.

No. 134. Mr. James Quartley's bull "Napoleon," red, 2 years and 6 months. This is a beautifully formed animal, very symmetrical and compact, and of exceeding

quality; handsome head; hips, as usual, somewhat too narrow; flank and other lower parts fair, though rather defective. First prize of £30.

CLASS II.—*Bulls calved since the 1st July, 1853, and more than 1 year old.*

No. 135. Mr. G. Turner's bull "Omar Pasha," red, 1 year and 4 months. This is one of the most evenly-formed and symmetrical little animals we ever saw; the head and horn a little too long and thick; hips, as usual, too near. He is small, and low standing, but of excellent quality. First prize of £25.

No. 136. Mr. W. Farthing's bull "Lord Quantock," red, 1 year 6 months, and 1 week. This animal is not so well formed, being high on the shoulder, and girth defective. He is of good length, with deep frame. Second prize of £15.

CLASS III.—*Bull-calf, above 6 and under 12 months old.*

No. 137. Mr. G. Turner's bull-calf "Zouave," red, 8 months. This is an exceedingly well-formed little animal, and well worthy of the distinction he has attained—the prize of £5.

CLASS IV.—*Cows in-milk or in-calf.*

No. 138.—Mr. W. Holes' cow "Juno," red, 5 years and 5 months. This is a well-formed, fine cow; her tail rather low.

No. 140. Mr. G. Turner's cow "Hawthorn," red, 5 years and 6 months. This cow has a good frame, shoulder well out and full, chine thin, and sides rather flat; hips and tuts good; of excellent quality of flesh. Second prize of £10.

No. 141. Mr. G. Turner's cow "Lady," red, 6 years and 4 months. This is a deeply-formed cow, perhaps too low and too small, but uniformly good; shoulders well out, loin very good, and ribs well out; hips narrow; a well-proportioned animal. First prize of £20.

No. 142. Mr. W. Farthing's cow, "Kate," 4 years and 3½ months. Deeply framed, but not level; rather wide hips, good tuts, and stands well. Highly commended.

CLASS V.—*Heifers in-milk or in-calf, not exceeding three years old.*

No. 144. Mr. G. Turner's heifer, "Tetania," red, 2 years 3 months, is very symmetrical, of beautiful quality and proportions; twist rather scant. Second prize of £10.

No. 145. Mr. W. Farthing's heifer, "Fancy," red, 2 years 4½ months. A beautiful heifer, of long and substantial frame, wide and good, with qualities denoting good lean flesh, but not of first-rate quality. Highly commended.

No. 146. Mr. James Quartley's heifer, "Stately," red, 2 years 6 months, is small, but of exceedingly good quality; very compact and proportionate form. Prize of £15.

No. 147. Mr. T. Webber's heifer, "Princess," red, 2 years 7 months, is a large good heifer, of more frame and substance, but common looking. Highly commended.

CLASS VI.—*Yearling Heifers.*

No. 151. Mr. James Quartley's heifer, "Moss Rose," red, 1 year 6 months. This is a beautiful little heifer, deep frame, and well filled out; tuts short, and tail rather high. Second prize of £5.

No. 152. Mr. James Quartley's heifer, "Nonpareil," red, 1 year 6 months. This is a still more compact heifer, and of fuller frame; tuts much better, and her quality of flesh possibly rather better; very complete. First prize of £10.

No. 153. Mr. T. Webber's heifer, "Young Curley," red, 1 year 7 months. This is a heifer possessing a heavier frame, and denoting more lean flesh. Commended.

AYRSHIRE.

CLASS I.—*Bulls of any age.*

No. 154. Mr. John Stewart's bull, "Walter," brown with brindle and white, 5 years 3 months. This bull is very poor, but he possesses a natural frame of deep proportions; deep chest; level, straight, narrow back; good flank, chine thin, and ribs flat. A good poor bull, and proved so by his having taken 40 prizes previously. The prize of £10.

CLASS II.—*Yearling Bulls.*

No. 156. Mr. J. Stewart's bull, brown and white, 1 year 4 months. This is a very little animal, with no merit; very small, and of inferior frame. The prize of £10.

No. 158. Mr. W. Muir's bull, "Tinto," white and brown, 1 year 1 month. This is a nice-bred animal, of fair form, but dark muzzle.

CLASS III.—*Cows of any age.*

No. 163. Mr. W. Muir's cow, "Lady Scott," brown and white, 4 years 3 months. This is a light-fleshed, narrow-backed animal, possessing no very useful qualities, except for milking. Prize of £10.

CLASS IV.—*In-calf Heifers.*

No. 164. Mr. J. Stewart's brown and white heifer, 2 years 4 months. This has a better frame, but small. Prize of £5.

No. 165. Mr. W. Muir's heifer, "Lilly," brown and white, 2 years 4 months. This has a better frame, but not so good in quality; dark muzzle; not such good milking properties. Commended.

ANGUS AND OTHER POLLED BREEDS.

CLASS I.—*Bulls of any age.*

No. 166. Mr. W. M'Combie's bull "Hanton," black, 3 years and 4 months. He has a long and good cylindrical frame, broad back, deep form, and level; chine and shoulder level, and good; chest full, and deep; ribs rather flat, but very long; flank good, and full; twist good; rump long. He is, altogether, a splendid specimen of the breed. Prize of £10.

CLASS III.—*Cows of any age.*

No. 168. Mr. W. M'Combie's Angus cow, black, 5 years and 4 months. She has capital hips, deep frame, girth slack; hind quarters deep, long, and wide. Prize of £10.

CLASS IV.—*In-calf Heifers.*

No. 169. Mr. W. M'Combie's Angus heifer, black, 2 years and 6 months. This is a first-rate animal of the breed: shoulders full, and well out; chine fair; hips fair; rump long, and full; tuts good. Prize of £5.

HIGHLAND AND OTHER HORNED BREEDS.

CLASS II.—*Yearling Bulls.*

No. 171. Mr. N. Malcolm's West Highland bull "Young Glenlyon," black, 1 year and 3 months. This is a fair-formed bull of the kind, but not so good in general frame as several others of these breeds. Prize of £10.

CLASS III.—*Cows of any age.*

No. 172. Mr. N. Malcolm's West Highland bred cow "Duebeg," black, 6 years and 2 months. A fair-formed cow, but nothing worthy of direct commendation here. Prize of £10.

SPECIAL PRIZES OFFERED BY GEORGE HEAD HEAD, Esq.

CLASS I.—*Galloway Bulls, not more than 4 years old on the 1st of July*, 1855.

No. 744. Mr. J. Sutton's bull "Adonis," black, 2 years and 11½ months. He possesses a very deep frame, with flat side; an uneven back and ribs, not springing well out; rump and tail high. He is, however, a heavy, good animal of the sort. Commended.

No. 745.—Mr. J. Graham's bull "Wellington," black, 3 years and 4 months. He has a good and long frame, of deep form, and well made; chest full, shoulder well out, sides deep and flat, loins and hips rather narrow, but capital thighs and fair rump; neck level, and good. First prize of £25.

No. 746. Mr. J. Carruther's bull "Ranger," black, 3 years and 3 months, is a very heavy bull; high neck, flat sides, but very deep; very long frame, rather uneven back, but very deep through chest; hips too near, tail too high. Second prize of £10.

No. 748. Sir James Graham's bull "Young Moss Trooper," 3 years 11 months. His length is extraordinary, and of great height, good hips, short rump, sides flat and deep.

No. 749. Mr. T. Teasdale's bull "Prince Charlie," 3 years 2 months, black. This is much more compact in form, and of good quality of flesh, a deep full chest, hips too high.

No. 750. Revd. T. Coats Cane's bull "Dombey," 2 years 6 months. This is a good bull, fair frame (rather wild), of good quality, level, and deeply formed throughout.

CLASS II.—*Galloway Bulls calved since 1st July, 1853, and more than 1 year old.*

No. 751. Mr. James Beattie's bull "Young Moss Trooper," 1 year 2 months. He has a level fair back, good out shoulders, good frame, deep thighs and flank, and long deep ribs. First prize of £15.

No. 756. Mr. J. Birrell's bull "Freebooter," black, 1 year 2 months. This animal is very compact, and well made, not too long, frame deep and full, hips too narrow, the sides, like all the breed, too flat; a good animal. Second prize of £10.

CLASS III.—*Cows in calf, or in milk.*

No. 760. Sir J. H. Maxwell's cow "Janney," 6 years 2 months, is a fair poor cow; level back, good hips, sides too flat, but deep.

No. 761. Mr. James Beattie's cow "Maggie," 5 years 3 months. This is really a good cow; her form approaching that of the best short-horns; deep and good outline, and not too long. First prize of £15.

No. 770. Mr. J. Grainger's cow "Kitty," 3 years 10 months. This is smaller, but very compact (a bonny beast) and good in quality; level back, sides a little too flat, chine not wide, hips rather low. Second prize of £10.

There are many useful good cows in this class, but of such similar make, that it is unnecessary to criticise them.

CLASS IV.—*Pairs of Heifers in calf, or in milk, and not exceeding 3 years old.*

No. 779. Mr. J. Pearson's heifers, 2 years 8 months. They are a pair of good well-formed heifers. The smaller one of good form, and more compact; as usual, rather long frames and deep sides. Second prize of £5.

No. 781. Mr. G. Riddick's heifers, 2 years 2 months. These are a pair of good well-formed heifers (the smaller one of capital fatting qualities). First prize of £10.

SHEEP.

In giving a notice of the various sheep classes, it will be our aim to confine all our comparisons to each particular breed, variety, or class of sheep under consideration: it being altogether beyond our province to dictate the relative merits of different breeds.

That the show of Longwools should have equalled in number that at Lincoln was not to be expected; but here at Carlisle we are in the midst of Shortwoolled and Mountain breeds, and not inconveniently distant from some of our famous Leicester districts. However, our first-class breeders are enterprising enough to send their animals from the extreme south, east, and west, as well as from the neighbouring north; and the introduction of Leicesters and Southdowns into Scotland and the northern English counties for producing crosses with the Heath sheep and other breeds, has proved an additional inducement for the southern breeders to contribute largely to the Society's show-yard. Again, the spirited manner in which the special prize classes have been swelled by entries from Scotland and from the mountains of Cumberland and its neighbouring counties, has combined to produce a larger show of sheep than the Society has ever before collected for the public.

The number of sheep exhibited at different meetings is as follows—that is, reckoning a pen of ewes as one entry:

Meeting.	Leicesters.	Southdowns, &c.	Longwools.	Other breeds, & extra stock.	Total sheep.
Northampton, .. 1847	85	71	29	4	189
York, ... 1848	134	46	37	11	228
Norwich, ... 1849	102	79	29	7	217
Exeter, ... 1850	79	80	30	8	197
Windsor, ... 1851	126	132	29	19	316
Lewes, ... 1852	55	88	15	25	183
Gloucester, ... 1853	64	95	80	53	292
Lincoln, ... 1854	102	67	96	38	303
Carlisle, ... 1855	119	51	63	97	330
Average number at one show	97	79	45	29	251

LEICESTER SHEEP.

CLASS I.—*Shearling Rams.*

Nos. 275, 308, 309, 310, 311, and 312. Mr. S. Kingdon's shearlings are a very useful lot, and do him credit as a breeder; have much good wool; too slight frames.

Nos. 282, 283, 284, 285, 286, and 287. Mr. G. Radmore's shearlings are a serviceable lot, having pretty frames, good looks, and fair wool.

Nos. 288, 289, 290, 291, 292, 293, 294, 295, 337, 338, and 339. Mr. T. E. Pawlett's shearlings. It has often fallen to our lot to look over with approving feelings the many splendid lots of sheep exhibited from time to time by Mr. Pawlett. We cannot spare so much space as usual for our analysis of them, and must

content ourselves with a mere notice of them, good as they are. No. 292 has a pretty smart countenance, good chine and plaits, deep form, good breast-end, loins fair and covered, good hand, rump short; wool rather too straight in staple. Commended. No. 293 has a very compact, neat frame of excellent mutton, well thrown out at his various points; rump rather short; good chine, but forward into neck, leaving it somewhat narrow; plaits not heavy; wool too straight in staple; general outline very good. Second prize of £15. No. 295 we like quite as well as 292: he has better rump, better plaits, and better form, being more compact.

Nos. 296, 297, 298, 299, 300, and 301. Mr. G. Turner's shearlings are in accordance with what he has usually shown us; but we thought them improved in general outline, being more compact in frame, with greater substance, somewhat shorter legs, and better necks; the wool fully equal to former years.

Nos. 314 and 315. Mr. J. Douglas's shearlings. These are useful, ordinary sheep.

Nos. 319, 320, 321, and 322. Mr. R. W. Cresswell's shearlings are of a better character than some others, and denote true breeding from Mr. Pawlett's stock.

Nos. 323, 324, and 325. Mr. John Davison's shearlings. Useful sheep, but unequal in wool, size, and mutton.

Nos. 326, 327, 328, 329, and 330. Mr. Sandy's shearlings. These are fine sheep, of surpassing merit. No. 328 has a very excellent back, and loin very good; chine not wide, nor well-covered; plaits good and full, but not heavy; rump rather narrow, but fair form; flank and twist not very good; leg rather scant for a first-class animal; hand good; wool fair, and rather curly; symmetry very good. First prize of £25. No. 327. This we think a better sheep than 328: he possesses more substance, of equal quality and symmetry; he has a fine head, neck, chine, breast, shoulder, and plaits; broad fat loin, wide hips, well covered; wide rump, rather short; good thigh and twist, and great depth of frame, and firm, fast mutton, with good wool and plentiful. Highly commended. No. 329 is a very good sheep, and of very similar form, with a somewhat better rump, but hips narrower, and less wool. No. 330 is a pretty deeply-formed sheep, has a level, good back and loin; neck good; hips too near; rump rather short and narrow; wool good, and fine head. Commended.

Nos. 331, 332, 333, 334, 335, and 336. Mr. John Borton's shearlings. These are a good lot, and possess a decided character. They have a considerable fleece of good wool, fair compact frames, of good size, and heavily loaded, but rather loose hand; they have good looks, and match well.

CLASS II.—*Rams of any other age.*

Passing a few useful sheep, we come to—

Nos. 347, 348, 349 and 350. Mr. T. E. Pawlett's. These are an exceedingly good lot: 347, a rather long frame; 348, a well-formed deep frame, with broad chine, and good rump; 349 is heavily loaded with firm good mutton, has a fine frame, good looks, wide loin, and heavy rump. He is rather short. Commended.

Nos. 351 and 352. Mr. G. Turner's sheep. These have rather long but good frames, keep their character, and are very useful sheep; their necks rather too long, and thin; wool looks good. This form appears to be the favourite one in the south.

Nos. 360 and 361. Mr. Douglas's sheep, have fair good frames; heads and necks somewhat plain, and too large.

Nos. 362, 363, 364, 365. Mr. Cresswell's sheep are four very useful animals: 362 is a very good sheep, his forequarter lying well out, but gradually declines in form till you find his rump too narrow; 365 has a soft, fat, straight back, and is a very useful letting sheep.

Nos. 366 and 367. Mr. John Davidson's. These are two fair-formed and heavily-laden sheep; their wool too straight in staple.

No. 368. Mr. Sanday's sheep, 52 months. He has an unusually small and pretty head, good neck, and thick, but low and short, going well into shoulder; chine good, and also rather low; plaits exceedingly good, and hanging, which do not improve the chine; back broad and fat; loin broad; hips not wide, but well covered; rump rather narrow, but heavy, and rather drooping; thigh and flank rather scant. He has a good fleece, and his mutton firm and excellent in quality. First prize of £25.

No. 359. Mr. Sanday's. He is smaller, but very compact in frame. Commended.

No. 370. Mr. Sanday's. He is a good and heavily-laden sheep; chine not quite right; loin narrow, but deep thighs; and good flank, plait, and breast.

No. 371. Mr. Sanday's. This is a somewhat shorter sheep, but very compact, and well formed; his hind-quarters superior, loin rather thinly covered, hips wide, and fat thighs; good twist and flank, rather thin plaits, and bosom good; fair fleece, and good hand. Second prize of £15.

No. 372. Mr. Sanday's. His form is almost perfect; deep through chest; capital breasts and plaits; loin, thighs, and twist good. His out-shoulder is very superior, his wool plentiful, and mutton firm, and excellent quality. Altogether, a first-rate sheep; and let last year for 81 guineas. Highly commended.

Nos. 374 and 375. Mr. John Borton's sheep. These are large well-formed Leicesters: 374 is very broad, in many points his hips and plaits the best, and best covered, of any in the class; his hand rather loose. We think he was the heaviest Leicester in the yard. 375 has a well-formed, heavily-laden forequarter, but poor rump.

No. 376. Mr. Pawlett's sheep. He has a good form, good rump, and fine hand.

CLASS 3.—*Pens of Five Shearling Ewes.*

No. 390 and 391. Mr. Thos. Mason's ewes are of good size and well got up, but not to our taste as to character.

No. 392 and 393. Mr. Sanday's ewes are exceedingly good, and match admirably: rather larger than at previous meetings, but not we thought quite so compact in frame and full in form. No. 392 received the First Prize of £20, and 393 the Second Prize of £10. There were none in the class, numerous as it was, to compare with them.

SOUTHDOWN, OR OTHER SHORT-WOOLLED SHEEP.

CLASS I.—*Shearling Rams.*

No. 394, 395, 396, 397. Mr. W. Rigden's sheep. These are a beautiful lot, and remind us of "Jonas Webb's" best days. No. 397 is a first-rate specimen of the breed, very level in form throughout, stands wide, has a capital breast, good chine, and shoulder well out; his fore-quarters very good and heavy, his loin wide and well covered, hips wide, and rump and dock full; mutton of firm and prime quality; wool thick-set, fine, and plentiful: looks very handsome. First Prize of £25. No. 396 is of very like character, rather larger; loin not so good. Commended.

No. 398, 399, 400, 426, 427, 428. Mr. Lugar's

sheep are after his usual character; rather larger, but not so compact in form or heavy in frame; higher standing and rather longer; they have, however, much substance, deep thighs, and good bosoms, with plenty of wool. No. 400 is a good sheep, but his neck is too thin, as is his shoulder and general fore-quarter. Commended.

No. 403 and 404. The Duke of Richmond's sheep. No. 403 is prettily formed, has a good chine and girth; 404 has a good chine and loin: both possess good looks.

No. 405, 406, 407, 408, 429. Lord Walsingham's shearlings denote a great similarity in character, and are very useful sheep. No. 405 is well formed, has a good chest, capital girth, and full thighs.

No. 410, 411, 412, 413, 414, 415, 421, 422. Mr. Jonas Webb's. He did not exhibit.

No. 423, 424, 425. The Earl of Chichester's shearlings are very superior animals. No. 423 is a splendid specimen; he has a fine level back, good plaits and chest, chine fair, hips and loin good but not large; his rump rather narrow; wool and looks good. Second Prize of £15.

CLASS II.—*Rams of any Age.*

No. 430, 431, 432, 433. Mr. Rigden's sheep. A really prime lot of very good sheep. No. 432 is a very compact well-formed animal; level and good throughout, he is of considerable length and breadth, has a capital girth, ribs stand out well, his hips and rump good, handsome looks, and wool light. First Prize of £25. No. 433 is not so well formed, but has many excellent points; his neck is thinner, and his ribs are not so well out and close up to hip as 432. Second Prize of £15.

No. 434 and 445. Mr. Lugar's sheep are very good. No. 434 is very compact in form and well ribbed-up to hip. We like his frame the best in the class.

No. 436. The Duke of Richmond's sheep has a long well-formed frame; his chest and girth very good; ribs nicely springing; excellent in quality.

Nos. 437 and 439. Lord Walsingham's sheep have a good form throughout, and rather long in frame; very good animals.

Nos. 441, 442, 443, and 444. Mr. H. Scott's sheep are very useful, common-looking sheep, of good serviceable character.

No. 447. Mr. E. Holland's sheep. This is called a Shropshire Down; he is a very large, good animal, but is not quite in character with his class.

CLASS III.—*Pen of five shearling ewes.*

Nos. 448 and 451. Lord Walsingham's ewes, 448, is a very useful lot, with good level well-formed frames, good backs, and match well; they denote true character. Second prize of £10. 451 is a good lot, and very pretty; commended.

No. 449. Mr. Lugar's ewes are a pen of well-formed ewes of exceeding good quality, large frames, and handsome looks. First prize of £20.

No. 452. The Earl of Burlington's ewes have large frames and good chests.

LONG-WOOLLED SHEEP

NOT QUALIFIED TO COMPETE WITH LEICESTERS.

CLASS I.—*Shearling Rams.*

Nos. 453 and 454. Mr. Handy's rams are large useful sheep; 454 has a good frame, with a curly fleece. (Mr. H. has a large lot outside the yard, to be offered for sale by auction.)

Nos. 455 and 456. Mr. J. Beatte's. These are behind in this class.

Nos. 457 and 458. Mr. T. B. Brown's are good useful shearlings, but not equal to many in this class; loins defective.

Nos. 459, 460, 461, and 462. Mr. Jno. Garnes' rams are a better sort, and denote good breeding; their form is not complete, but they are very creditable sheep.

Nos. 463, 464, 465, and 466. Mr. Fletcher's rams. These are large good shearlings, but not at the head of the class.

No. 467. Mr. Walker's ram is a large and fine sheep, with a fine good hand.

Nos. 469, 470, and 471. Lord De Mauley's rams are large, but have too narrow frames.

Nos. 472, 473, 474, and 475. Mr. Hewer's rams. These fully keep up the credit of this well-known breeder. They possess large, well-formed frames, of great substance and grand appearance. 472 is a fine animal; his head rather large, but handsome; neck full, chine rather narrow and bare, caused perhaps by his immense plaits; back good, and very fat deep thighs, hips wide and well covered, rump large and roomy; wool fair, but too straight in staple; girth 5 feet—a fine animal. Second prize of £15. 475 is of excellent form, with deep fore-quarters, chine not broad, but plaits full, legs good, rump rather short, but wide; good mutton and firm; wool plentiful—a very compact sheep; commended.

Nos. 476, 477, 478, 479, and 480. Mr. Lane's rams. These shearlings still keep Mr. Lane at the head of his class of long-wool breeders, and this lot is a splendid sample of the breed. No. 476 has capital plaits, chine rather narrow, rump not wide, and wool rather light, but of fine proportions. 477 has a good form, a fine head, neck rather thin, plaits very good, chine and ribs well thrown out, breast full, back broad and fat, loin well covered, rump rather short, but broad; hips good, but thighs and flank light; wool fair: altogether a very fine sheep. Commended. 479 is an extraordinary animal; he has a very large fine top, with a deep well-made frame, his depth through the chest being great, his girth being 5 feet 1¾ inches; his chest, bosom, and plaits all right and full; back level, broad, and fat; loin and rump good and broad; hips unusually wide, and well covered; legs stand rather too near, and his chine is too high for a first-class animal; thighs fair depth, flank good; wool heavy, and full fleece, but too straight in staple: he is a splendid animal, and deserves the first prize of £25. 480 is a very good sheep; chine rather high, not bare, but capital mutton.

Nos. 485, 486, 487, 488. Mr. W. Garne's rams. These are exceedingly good sheep, but not quite equal to some of former years. 486 is a well-formed shearling, with good mutton and wool; chine rather light. 487, fine frame, capital back, good flank, plenty wool. 488 has a large, full, and rather hanging rump, fine form, chine rather bare, flank and plaits rather scant for such a heavy sheep.

CLASS II.—*Rams of any other age.*

Nos. 493 and 494. Mr. T. B. Browne's rams. Two very good and serviceable rams. 493 is a very good two-shear. Commended.

No. 498. Mr. Jas. Walker's ram. This is a very heavy, good sheep, with a remarkably good chine and depth of frame, and great in substance and length; his rump rather short, but broad; flank thin; stands high. Commended.

Nos. 501 and 502. Mr. Lane's rams. These are ex-

traordinary animals. 501 has a good fleece of wool; his chine is not quite right, but his plaits are full and good; neck not full enough, loin very good and fat, back good, hips wide, and rump large; thighs and flank heavy; head rather coarse, and high top: a good two-shear sheep. 502 has a rather defective chine, but a very deep frame, of great length; capital chest, hips well out and fat; rump full, fat, and hanging; back and loins good and broad; plaits exceedingly good, legs too long, thighs and flank not full; wool too straight in staple: a great, good sheep. Second prize of £15.

Nos. 504, 505, 506. Mr. W. Garne's rams. These are probably the largest and finest specimens of the Cotswold breed in the yard. 504 has a beautiful frame, with fine full chine, from which the ribs spring properly; plaits extra good, and heavy; back good, fat, and level; loin broad, but not fat enough; hips and rump wide and fat; rump rather projecting and full, thighs deep and full, flank fair, breast-end broad and full, neck large, and head fine and well set, with good handsome looks, and good quantity of mutton; wool plentiful, but too straight. First prize of £25. 506 is in some respects a better sheep; he is beautifully formed, with a very even fat back and very handsome outline, and well proportioned and of exceedingly good quality throughout.

Class III.—*Pens of five Shearling Ewes.*

No. 507. Mr. Handy's ewes are a compact lot; there are two ewes in it of surpassing excellence.

Nos. 509 & 510. Mr. T. B. Browne's ewes are a lot of very useful animals, and well got up; they have large roomy frames, stand high, and are of good appearance; but do not prove quite so well upon examination. 509 is a pen of very large and fairly formed ewes, but rather too irregular in frame and hand to please our taste. There is one good ewe, with deep form and good chest, and well proportioned points, but not good looks; otherwise we characterise the pen as high standing, of fair length, with rather plain heads and necks, thin chine, high and bare chests and girths, light plaits, not full back, and loins narrow; hips not wide, rumps fair, thighs long but thin, flanks fair, wool good and fair quality, countenances long and coarse. The first prize of £20. 510 is a similar, but somewhat inferior lot. Commended.

No. 512. Mr. Fletcher's ewes are a pretty and useful lot, but small of the breed. Commended.

No. 513. Lord de Mauley's ewes are a good useful lot, certainly of good size, but uneven in form and appearance; loins high. Commended.

Nos. 514 & 515. Mr. Lane's ewes. These pens, we think, are of much better character, and truer to each other; they match exceedingly well; they are not so high standing as lot 509 probably, but more compact, and of better quality; they prove well on examination; we characterise them thus, and we are not very careful to select the pen; but we will take pen 515, and give our notes taken at the time—Five very nicely-matched ewes, with superior compact frames, broad back, and loins fat and firm; necks fair, and countenances good, with plenty of good wool, and stand well and high. We like 515 better than 514, which received the second prize of £10.

HERDWICK MOUNTAIN SHEEP.

Class I.—*Shearling Rams.*

We must be brief in these classes.

No. 516. Messrs. R. and J. Jackson's shearling has a very narrow, but deep frame; the ribs in these classes not springing from the back, but almost going directly down from it, forming bad flat sides. This was the fact in this sheep.

No. 517. Mr. G. Robinson's shearling has a fair back and loin for the class or breed, but still very narrow; it is, however, level, and he has a fair frame. Prize £7.

No. 518. Mr. Nelson's shearling; the same narrow chine, but fair thighs.

Class II.—*Rams of any other age.*

No. 524. Mr. J. Mounsey's ram. This has a fair form for the breed; his sides are not so flat, but his back and loins are narrow, and he really has a rump, which is hard to find in this breed. Prize of £8.

Class III.—*Pens of five Shearling Ewes.*

No. 530. Mr. Robinson's ewes are fair in their general form for this kind of sheep, and match well. Prize of £5.

We have refrained from giving our notes of these classes; they are as yet without any good definite animal form, as received at the present day. Their deep flat sides and narrow frames may serve for climbing purposes, but not for fatting. We think, with due attention—and we see it is given in some districts—these breeds may be improved in a greater degree than most other breeds are capable of receiving.

BLACK-FACED MOUNTAIN SHEEP.

Class I.—*Shearling Rams.*

No. 537. Mr. H. Shield's shearling is a fine specimen of the breed. He has a level back and loin, with chest; a deep rib falling directly from the back, forming a narrow frame; wool straight. Prize of £7. There was a good competition in this class, but all of similar general character, and the distinctions not great, nor easily defined; but still there are distinctions, as we may just jot down in haste.

No. 533. Light straight wool; narrow girth; fair back.

No. 534. Ditto, but better thigh, and more depth.

No. 535. Better wool; fair frame.

No. 536. Less wool; fair frame; more sprightly-looking.

No. 538. Back low; frame deep.

No. 539. Not wool, but hair; and not a good animal of the sort.

No. 540. Fair wool, but not much better in frame.

No. 541. Ditto, ditto.

No. 542. Better wool, deep thigh; and fair frame.

Class II.—*Rams of any other age.*

No. 546. Mr. C. Summers' ram. A good animal of the sort, and fair frame; good length and depth; rather better rib; wool straight. Prize £8.

No. 543. Wool light; has a fair rump.

No. 544. Fair.

No. 545. Ditto, but better.

No. 547. Ditto; bad chine and back, but general character good of the sort.

Nos. 555 and 556 are good specimens of the sort.

Class III.—*Pen of five shearling ewes.*

No. 558. Mr. J. Brydon's ewes. Fair animals of the sort; stand higher, and have more wool of fair quality. Prize of £5.

No. 557. Little hairy-looking thing.

No. 559. Better wool and better animal, but not so good as No. 558.

SPECIAL PRIZES,

OFFERED BY THE CARLISLE LOCAL COMMITTEE.

CHEVIOT SHEEP.

CLASS I.—*Rams not more than four shear.*

No. 645. Mr. F. Borthwick's ram, 3 years and 3 months. This is a large sheep of the breed and in the class itself; he has a level back, wide hip, and fair rump; fore-quarter not heavy; neck thin, and rather long: shown poor. Second prize of £7.

No. 651. Mr. James Brydon's ram, 3 years 3 months. This is a well-formed animal of his class; good chine, and deep in frame, with fair hips and rump, and fair wool.

No. 653. Mr. J. Carruther's ram, 27 months. This is a very good animal of his kind—having a broad level back, good loin and rump, deep thighs. Commended.

No. 654. Mr. S. Swan's ram, 48 months. He has great length; deep chest; shoulders well out; back and loin good; wool fair; and good mild looks.

No. 658. Mr. Thomas Elliot's ram. This is a splendid Cheviot sheep, with most of the good qualities of our better breeds, in good keeping; head fair; neck thick, and well set into chine; deep shoulders and chest; is well ribbed up; level back and good loin; deep thighs; good flank, and other under points; wool good, and plentiful. First prize of £15.

No. 659. Mr. T. Elliot's ram. This sheep is a more spirited-looking animal. His frame well formed; broad loin, and good outline: altogether a good sheep. Highly commended.

No. 660. Mr. W. Aitchinson's ram. This is a longer animal, but not so good in form: he has a deep flank and twist. Highly commended.

CLASS II.—*Shearling Rams.*

No. 665. Mr. T. C. Borthwick's shearling is of level frame and good length, with fair loin and back, and wool of good quality and fair quantity. Commended.

No. 666. Mr. T. C. Borthwick's shearling is much larger than the last-named, of rather long frame, but not broad. His thighs are deep, and his wool fine. Second prize of £5.

No. 669 is in very good form for the kind—level back and deep thighs.

No. 670 is a horned sheep, with a light frame.

No. 674 is a useful sheep. Fair form, and plenty of wool.

No. 677 is a fair, useful sheep.

No. 682. Mr. T. Elliot's shearling is a good specimen of the breed, with a fair frame, but rather too long and narrow; a level back, good rump, and long wool, fair quantity, and good. First prize of £15.

No. 683. Mr. T. Elliott's shearling is a mild-looking, good animal, with deep, fairly-formed frame, and plenty of wool. Highly commended.

No. 684. Mr. W. Aitcheson's shearling has a longer frame, of fair make, level back, and less wool, but fine. —Highly commended.

CLASS III.—*Pens of Five Ewes, not more than Four-shear.*

No. 686. Mr. T. C. Borthwick's is a pen of good Cheviot ewes. Large and fair frames, but uneven in form; deep bodies, fine looks, and uniform, wool fine. First prize of £10.

No. 687. Mr. T. C. Borthwick's pen of ewes, of similar form and description as the last. Second prize of £5.

CLASS IV.—*Pens of Five Shearling Ewes.*

No. 688. Small, but pretty.

No. 689. Mr. T. C. Borthwick's pen of five ewes is a very good lot, and contains a splendid specimen of the breed. They have long, fairly-formed frames, good backs, fair loins, good thighs; fine wool, and fair quantity. First prize of £10.

No. 690. Very thin and small; wool strong.

No. 691. Nice frames; less size, and less wool.

No. 692. Very nice little frames, and good looks.

No. 694. These appear to differ in their character; very thin and small.

No. 695. A very nicely got-up lot, well matched and pretty.

No. 696. These are large and good every way; deep in make and frames.

HORSES.

Before we arrived at Carlisle, we were assured on all hands that we should witness a very splendid assortment of horses there, superior to anything we saw at Lincoln; indeed, from the geography of that town, we had anticipated this much, nor have we been disappointed.

The number of horses (including stallions, mares, &c.) shown at each meeting for the last nine years is as follows:—

Meeting.	For agricultural purposes.	Roadsters and drags, &c.	Extra stock &c.	Total horses.
Northampton.. 1847	51	0	3	54
York 1848	57	7	9	73
Norwich 1849	77	11	6	94
Exeter..... 1850	49	10	3	62
Windsor..... 1851	78	42	0	120
Lewes..... 1852	80	7	0	87
Gloucester 1854	63	35	0	98
Lincoln 1854	76	12	18	106
Carlisle 1855	83	0	90*	173
Average number at one show.	58	14	14	96

* Clydesdales, 19; for special prizes, 45; for the mayor's prizes, 26.

In CLASS I., devoted *to Stallions for Agricultural Purposes, foaled previously to the 1st January*, 1853, we have 21 entries.

The first prize was awarded to Messrs. E. and M. Reed, of Beamish Burn, near Chester-le-street, Durham, for a bay 6 years old cart stallion, "Nonpareil." He is of Leicestershire breed, stands 16 hands 3 inches, but does not look this height, which our experience leads us to think a good proof that he is symmetrically formed. Such breadth of chest, such girth, and amazing quarters, we never remember to have seen. His forelegs stand well out, and are good types of strength and endurance. The hocks are broad in front; the neck is well set, finely arched, and the eye is full—in short, what a horse should require Nonpareil seems to possess.

The second prize horse stands 16 hands 2 inches; his colour is grey. A good style of farming horse. Fore-arm thick, and muscular, but the hind-legs too straight. The owners of this horse, "George Second," are the Messrs. S. and R. Spencer, of Flecknoe, Daventry, whom we shall meet in other classes.

Mr. Brown, of Farleigh Wallop, near Basingstoke, exhibits a son of his splendid horse, "England's Glory," which took the first prizeat Windsor. Were he all of a piece with his top, he would be the finest horse in the yard; but his legs spoil him.

Mr. Gill's "Belted Will of Cumrew," 16 hands 1½ inch, has nothing particular to recommend him; and has this decidedly against him, that his girth is too light.

"Young Champion," the property of W. and R. Hipwell of Swinford, stands 16 hands 2 inches. We may say of him that he is a whole brown colour, black legs, deep chest, head and neck deficient, and capped hocks.

With respect to Mr. Wilson's (Burgh-by-Sands) horse "Blaize," a dark bay animal, standing 16 hands 3 inches, we heard many different opinions as we stood by him. We thought him well adapted to get fine active animals out of thick-set mares.

We were very glad indeed to find Mr. Barthropp exhibiting his Suffolk stock again. The size of the Suffolk is inclined to be small; and Mr. Barthropp seems to be very successful in enlarging it, increasing in like manner the strength of both joints and sinews. The "Punch," at a late meeting of the Society, carried away the majority of the prizes; but up north he receives no notice scarcely, although the punchy form (the Suffolk style of horse) amongst other breeds takes priority over the larger sizes. We like, for our part, the roundness of barrel, the compactness of form, and the great activity of this breed: we like their clean legs, fine heads, and "aye-ready" air. His mares are most deservedly popular in Suffolk, and we desire they may become so elsewhere. Of the two fillies exhibited at Lincoln, Mr. Barthropp made nearly £300; and who can say that he is not wiser to keep to a breed so valuable as his?

Mr. Stamper's horse "Champion" stands well. His height is 16 hands 2 inches; good head and neck, capital thighs, long reach; has that about him which betokens splendid and very powerful action; "is come of the best mare in Cumberland," as we heard.

Mr. Townsend's "Duke" is short and compact, but deficient in his quarters.

The Duke of Manchester again exhibits a pretty little Suffolk stallion, but he has not sufficient substance.

The monster horse "Glengary," the owner of whom is Mr. C. Phillips, near Brampton, should not have been entered in this class. For "agricultural purposes" he is too large. He comes of the same dam as the horse that takes the first prize awarded to "Clydesdale," and should, we think, have been exhibited in that class. Mr. Whitehead's "Waxwork" (Cambridge) has a grand thigh, but a rather deficient arm. Take him all in all, he is one of the best horses we saw: he is sold into Aberdeenshire. He stands 16 hands 3 inches. The two horses that stand next possess but little merit: one is decidedly weedy; but Mr. Graham's (of Lawstown) "Young Blythe" shows a fine top, flat, strengthy fore-legs, and good hocks.

In Class II., *Stallions for Agricultural Purposes, foaled in the year* 1853,

the award of the two prizes led to considerable difference of opinion. When we first saw Mr. Bailey's "Koh-i-noor," we quite expected to see the name "Agronomer," and "Mr. Robert Howard," as owner, attached to his number in the catalogue. Just such an animal as "Koh-i-noor" should the latter-named horse be, arrived at this his second year. Surely no one who was at Lincoln can forget the marvel of the horse-show, exhibited by Mr. Howard! We hear that one of our colonies possesses him. "Koh-i-noor" is furnished like a four-year-old horse; he is admirably put together, stands 15 hands 1 inch; arm and thigh unexceptionable: he won the first prize at Tiverton in June last, and a prize as a foal at the Gloucester Meeting. The result of a comparison between this horse and the horse that received the first prize (the property of Mr. Robert Smith, of Ladyland, near Dumfries) was, in the first case, favourable to the former; but, upon closer examination, we came to see that the legs were decidedly better, and the thighs bigger, in Mr. Smith's horse than in Mr. Bailey's; and although we observed a contraction of foot, a greater length of barrel than is desirable, and a coarseness of head in the first case, we thought we saw a full compensation in the fact that in the one there were unmistakeable signs of growth; while in the other, precocious beyond his years, there was a positive probability that any advance he might make must be very limited. The prize-horse stands 15 hands 3 inches.

The two-years-old, shown by Mr. Ayres, of Cardiff, is a fine horse in himself; he would have been seen to better advantage if, instead of having stood next the prize-horses, he had stood beside Mr. Gulland's specimen of horseflesh.

Mr. Wilson shows a Suffolk horse, standing 15 hands 2 inches, that promises very well, and we were looking about to see a card of commendation in his stall.

Mr. Steel's "Grey Wallace" should have been entered amongst the "Clydesdale." He has not sufficient breadth of hind-quarters.

Mr. Nixon, Newcastle, exhibits a fine Northumberland horse, standing 16 hands 2 inches; rich bay, splendid black legs, good expansive foot, muscular fore-arm, quarters unexceptionable.

Mr. Barthropp's "Ruler" is too lengthy in leg and body.

In Class III., for *Agricultural Stallions foaled in the year* 1854,

Messrs. S. and R. Spencer, the winners of the eleventh prize in the first class, bear off the first prize. Too much cannot be said in praise of their yearling. Except the one Mr. Howard exhibited at Lincoln, we never remember to have seen anything so remarkable. A bystander, seeing us taking notes, said, "You may think and say all you like about that animal: there can have been not a moment's hesitation in making the award in this class." For our part, we look as shyly on precocious yearlings as we do on precocious children—they nearly always disappoint our expectations. The colour is brown roan, legs black; height 15 hands 2 inches.

Mr. Bailey shows a half-brother to Koh-i-noor (15 hands), that won a prize at Tiverton in June last. He is a compact, clever fellow, with beautiful legs and strengthy hocks.

Mr. Wilson exhibits the best specimen of a Suffolk yearling we ever saw. He has unusual size, and a great deal more bone than we generally notice in the breed. From the exertions of Mr. Barthropp and Mr. Wilson, the patrons of the Suffolk horse may hope great things.

Mr. Ritson shows badly by the "Prize," being narrow and weedy: and so does Mr. Howard's, though a vastly better animal than Mr. Ritson's.

Mr. Church, of Canonbie, and Mr. Gibson, of Carlisle, exhibit very different specimens of yearlings: one is pretty slight, the other is big and spawny, with a remarkable weight of bone.

Mr. Bryan's chestnut yearling is leggy, short-bodied, and famously quartered: Mr Dennison's is big and spawny, too long; good legs.

The Messrs. W. and R. Hipwell's bay-brown yearling is very honest, and good every way—"a bonny beast," in fact.

Mr. Murray's "Sir C. Napier" looks rather like a weedy specimen of the old-coach breed!

Messrs. Kerr and Raine show two small, but very stiff, symmetrical animals, well-topped; their bodies and legs seem to belong to them—which is more than can be said of some in this and other classes.

Mr. Pattinson's "Tom King" is a fine sturdy fellow, spawny and growing; plenty of bone.

CLASS IV.—*Mares and Foals for Agricultural Purposes.*

There is a Peeress here in her own right. This is the style of mare to breed stallions. She seems capable of materially improving the breed of a whole district. We hope Mr. Robert Murray, her owner, will see her value in this light. Any one to see her beautiful fine-made head, her rainbow neck, her square roomy frame, her splendid quarters, her muscular well-defined legs, and her broad open foot withal, cannot fail to be her admirer, and of opinion with the judges, who deemed her worthy of a prize. The mare that takes the first prize in this class is Mr. David Bird's "Snip," a smaller, but a most exquisitely perfect animal. She is clean-legged and black. Everything about her is as it should be, saving perhaps that the withers come scarcely in enough to the shoulders. Such quarters! How her shoulders stand out! What a noble air of conscious strength and beauty she wears! Her foal is certainly much finer than "Diamond's;" and in as far as "Diamond" is light grey, "Snip" has so much the advantage. Mr. Gill's is a fine roomy grey mare, with a capital foal. "Sally," a Clydesdale, the property of Mr. Graham, jun., Canonbie, is a good style of farmer's mare, but her back is long and quarters short. Mr. Jonathan Irving's is a fine mare, and finer foal. This, again, is a regular farmer's mare, with good legs. Lord St. John's is a good mare, as far as form goes; but, judging by the condition of the foal, a bad suckler. This seemed to be a very popular class, and most deservedly so.

CLASS V.—*Fillies for Agricultural Purposes.*

The first and second prize animals in this class belong to one owner, Mr. Edward Holland, Dumbleton Hall, Evesham, and are half sisters. The prize filly is a red roan; the second prize is iron-grey. The judge must have found it difficult to decide here: there is size and abundance of weight in both. The roan has a coarse queer head, and heavy cheeks. Mr. Barthropp is strong—very strong—in this class. He shows three fillies, and we think that the Suffolk is scarcely capable of attaining a higher perfection. One of them obtains a high commendation, and richly deserves it. Mr. Holmes's filly, "Jane," should breed some superior Clydesdale stock. Mr. Barlow's Suffolk has something that approaches a "goose rump."

CLYDESDALE HORSES.

The fact that this breed is rapidly rising in estimation, and is now undergoing considerable modifications and improvements, chiefly for farm purposes, gave to us an additional interest in this class. It is supposed to have originated about one hundred and thirty years ago, between the common Scotch pack horse and the Flanders mare. There seems to be no description of horse that is so well adapted for single horse carts. Their usually light bodies, long legs, and good courage, enable them to do a great deal of work in a little time. The characteristics of the breed some years since were coarse heads, flat sides and quarters; and though in some instances we noticed such defects, they are now nearly lost by better attention amongst breeders. One of the greatest defects that struck ourselves was the *variable* character of the breed. They were all sizes: no sort of certainty. The breeder may scarcely seem to have any notion as to whether he may be blessed with a mammoth or a Galloway. When a breed does not perform logically, the breeder cannot argue logically. The liberal premiums offered by the Highland Society have generally attracted some splendid animals to the Glasgow meetings. Those who competed at Glasgow in 1850 were brought *bonâ fide* from the streets of that city, attended by their usual drivers, and mounted with their usual harness.

CLASS I.—*Stallions foaled previously to the 1st of Jan.*, 1853.

In this class there are seven entries. "Reformer," Mr. Haig's, of Kirkcaldy, has a noble top, good short legs, arm rather slight, hocks capped and defective. "Robert Bruce," Mr. W. Irving's property, of Lockerbie—strong legs, narrow girth. Messrs. E. and M. Reed's "Prodigy" is not so much a prodigy as their prize "Nonpareil," but he is a right sturdy, compact, farmer's horse. Mr. Nichol, of Skelton, near Penrith, shows his noble cart-horse, "Newminster," whose legs are fair, but whose hocks are defective. Messrs. B. Weir, near Carlisle, and C. Philips, near Brampton, stand unrivalled in this class. Mr. Weir's "Young Conqueror" is highly commended. He won the second prize at Carlisle in 1853, and the first in 1854. He is in rather low condition, stands 17 h. A fine type. Mr. Charles Philips' "Merry Tom" well merits the prize, however. His full eye, his noble head, his arching neck, his abutting shoulders tapering upwards, his compact short barrel, his great muscular quarters, his unexceptionable legs, and horny expanded foot, all go to make him what he is—the most splendid horse in the class; we had almost said A 1 of the Clydesdale stock horses. These two animals, "Young Conqueror" and "Merry Tom," each reflected merit from their stock; for there are several two-year-olds and yearlings by them. For instance, in

CLASS II., *for Stallions foaled in the year* 1853,

that splendid horse "Xanthus"—"the very image of his father," and the property of Mr. James Newbigging, who wins the first prize with him—is by Merry Tom." The son in his own person commends the sire, and the sire the son. Nor does "Robert Bruce," the property of James Carlyle, disgrace the same parentage. Should "Young Clyde," the progeny of "Young Conqueror," ever fill out, he will prove a most enormous horse; he stands seventeen hands and half an inch now! In the same class, Mr. Wilson's "Wonderful" merits his name, so far as height contributes to fame; but his carcase is too narrow, and he looks too leggy.

CLASS III.—*Mares with their foals.*

Mr. Douglas, of Drem, takes the first prize with "Data," her legs being winners. Mr. Gibbons' is a small mare. The foals in this class are fair.

CLASS IV.—*Fillies foaled in the year* 1853.

Of the two fillies that compose the class, Mr. Paterson's "Damsel," a useful, but not very remarkable animal, receives the prizes. Mr. Bell's "Pride-o'-the-North" is a monstrously tall, long-legged creature. We hope that the *pride of the north* may be moderated to a more reasonable and practicable compass.

It may be well here to take fifth, sixth, and seventh classes of the *Extra Stock*, so that the hunting and coaching stock may come together. With respect to

CLASS V., *for Three-year-old Cart Fillies,*

the uncommon girth of "Jess," a brown filly, the property of Mr. Miles Bell, and the winner of the prize, quite astonished us; it must be more than eight feet. "Jin," a fine brown filly, claims "Merry Tom" for her sire; but we cannot particularise here, the prin-

cipal difference seems to be in colours. We never saw such a splendid assortment of fillies, and we are assured that the best are still at home. If so, most counties stand A 2 to Cumberland. The judges were evidently in the same fix as ourselves; they commended the entire class, there being eight entries.

CLASS VI., *for Three-year-old Cart Geldings.*

In this class there are two right good animals. The competition was between a grey and a bay gelding. There must have been some trouble to award the prize here. The bay has finer quarters and greater girth. The grey's arm is best, but below the knee and hock the bay has it. Altogether, the bay is the best animal, and accordingly receives the prize. Mrs. Ann Tinning, of Longtown, is his owner, and Mr. Bainbridge, Carlisle, the owner of the grey.

In CLASS VII., *for Two-year-old Cart Geldings,*

there can have been no difficulty in making the award. The superior height, substance, and expansiveness of Mr. Stordy's grey gelding made it evident to the most untutored eye where the right lay.

Under the head "Special Prizes offered by Robert Ferguson, Esq., Mayor of Carlisle," there are two classes. In one we find "Thorough-bred Stallions," in the other "Coaching Stallions."

Throughout the kingdom there seems to be a great and increasing cry for horses. "For love or money, let me have a horse," cries one. "No such thing as a good horse to be found now-a-days," replies another. We all agree that the "hack" may be classified amongst the extinct animals. Many causes have combined to lead farmers to breed cart-horses exclusively. The breeding of horses for active service has been regarded an unprofitable speculation—more within the sphere of gentlemen and landlords; and some scribblers have written it down as such. But the experience of our most celebrated men—men who have gained their names by a careful attention to pedigree and judicious selection—prove this to be quite otherwise. And, indeed, while many of us are selling any ordinary half-bred two-year-old for twenty and thirty pounds, we surely want not much better proof to convince us that we cannot do better than to breed that description of animal which is in most request.

Mr. Tweed, mayor of Lincoln, gave the first stimulus in the right direction last year. It seems to be a pretty generally recognised fact, that whatever the mares may be, the stock horses must be *thorough-bred*. Some of the best of the class then in the neighbourhood Mr. Tweed's prizes drew out at Lincoln; and Mr. Ferguson, who has done well to follow so good an example, has by his prizes drawn together a fine lot of first-class horses, which are exhibited, in many instances, in the same yard with many of their own progeny, and in this relationship it is well that we should see them. The Royal Agricultural Society may thus impart an incalculable benefit upon those districts of the country through which she passes. She arouses attention to a national want, a want that agriculturists can alone supply, and points to the means by which they may do it. This, as we take it, is her business; and we hope we shall not only see her affording an opportunity to spirited mayors to show their liberality, but offering such prizes out of her own coffers as will bring out to general view the number and quality of thorough-bred stock horses.

Amongst the thorough-bred stallions there are two to be especially noticed—"Ravenhill," the property of Mr. Richard Ferguson, of Harker-lodge, Carlisle; and "A British Yeoman," belonging to Messrs. R. and J. Moffitt, of Newtown, Carlisle. "Ravenhill" is an Irish-bred horse, standing 15h. 2in. His knees are bad, and his fore-legs are altogether defective; but his head is small, his neck thin, his crest firm and arched; his chest is not very broad, nor his body very compact, nor is there sufficient substance of bone in his legs. Besides the good points I have named, "A British Yeoman" possesses, furthermore, a compact body, well ribbed up, hocks well bent, fine reach of hind-quarters (or power to push him over difficulties), and broad, well made feet, turned out. Unfortunately he is lame. To this circumstance alone we attribute it that Ravenhill took the prize.

Judged by their stock, several of which, from yearlings up to three-year-olds, are to be seen in the yard, these horses merit the very high reputation they have gained. Ravenhill is the sire in nine cases, and the Yeoman in seven—two of these seven taking each a first prize.

"Emerystone," belonging to Mr. W. Talbot Rothwell, Foxholes, near Lancaster, did not attract much attention. There was only one specimen of his stock in the yard, and that was ordinary. "The Era," belonging to Messrs. Hepworth and Wilson, of Langrick Ferry, was here. He is an aged horse, standing 15½h. 2in. Three premiums have been awarded by local societies—Howden, Worcester, and the Yorkshire Agricultural Show. "The Cure," standing 15h.2in, 14 years old, bay, is remarkable for his fiery eye, his splendid head, neck, and shoulders. A foal of his getting, amongst the mares for breeding hunters, catches his character, and proclaims his merit. He belongs to Mr. John Ashton, Brigg, Lincolnshire. Mr. Henry Scott Waring's "St. Bennett," from Darlington, is 21 years old, and a fine animal to the last. "Witton," sire Bay Middleton, has won two first-class prizes—one at the Cleveland Agricultural Show, the other at the show at Durham. He is from Thirsk, Yorkshire, being the property of Mr. Stephen Kirby. The rest in this class—"Larriston," by Muley Moloch, "Cyclops," by Venison, "Turnus" by Taurus, "Vulcan," by Voltaire, "Burndale," by Lanercost, "Colsterdale," by Lanercost, all the property of gentlemen residing north, have well-known merits peculiar to themselves.

CLASS II.—*Coaching Stallions.*

A word with reference to this breed, before we notice the individuals of which the class is composed. The old coach-horse is produced by a cross of the Cleveland mare with a three-fourth bred horse, possessed of sufficient substance and height. The result of this cross does not seem to give speed sufficient for these railway times. Our conveyances are made lighter, and our horses must travel faster. The cross between the Cleveland mare and the blood-horse will not alone effect this change; there need to be *two crosses* of blood: we shall then have what we want.

The premium is here awarded to Mr. Shaw, of Acomb Hall, near York, for his "Canrobert," a three years' bay horse. He has a deep, well-proportioned body; strong clear bone below the knee; his feet are open, sound, and tough; his form betokens splendid action, for which, we conjecture, he is mainly entitled to the prize, as many of his competitors can boast finer proportions.

Mr. Rayson's "Scrivington," a four years' bay, is a very superior animal, well suited for the purpose. Here is weight, blood—everything one could desire. How he carries his head! What a fine elevated crest! He comes of a very fine mare, "Violet" (whose sire is "Splendour"), to be seen in the yard, with foal at foot, sold already for 30 guineas. Mr. Ferguson's "Inkerman" is a fine colt, standing 16 h. 2 in. If he grows taller, he will be spoilt; but in case he fills up below, he will be a better horse than any in the class. Mr. Robinson's

"Nimrod" is indeed a mighty hunter; very heavy, but very honest, and is well adapted to cover slight blood mares. A review of this class satisfies us that we are correct in saying that the full-sized coach-horse is the over-grown hunter, too large for that sport.

And now for a brief review of the four classes that here come in place. In

CLASS 1, *Mares with Foal at foot,*

(SPECIAL PRIZES)

Sir Welfred Lawson, of Brayton, near Carlisle, receives the first prize for his beautiful Retriever mare, "Madam," the sire of the foal being "British Yeoman." Her form is very symmetrical; splendid head and neck; shoulders a little too stiff; her legs unexceptionable. Mr. Lee's "Jenny" is somewhat too heavily topped. Mr. Haig's foal is capital; the mare very noble-looking, with too long a back.

CLASS II.—*Three-year-old Harness Geldings.*

The merit of this class belongs to "A British Yeoman" and "Madam," three of the four entries being by the Yeoman, the prize gelding being by him, out of "Madam." It is the property of Sir Wilfred Lawson, and is a very stylish horse, standing 16 h. ½ in.

CLASS III.—*Mares for Breeding Hunters, with Foal at foot.*

There are 13 entries here. Mr. Swarbreck takes the prize for his famous old mare, "Beeswing." She is 14 years old, has run nine seasons, and her legs are without a puff or a strain. If we want models of breeding mares, here is the type. Miss Bell, a great patroness of the stud, living near Canonbie, shows two very beautiful mares, "Fancy" and "Vaultress," both with highly creditable foals by Ravenhill. The first is a stylish mare. "Vaultress" is the best—a lengthy strong mare; well-defined legs: she has won two steeple-chase races. Mr. Nicholson, of Kirkbythore, shows the right sort of roomy mare, with a foal by Ravenhill—Mr. Ferguson's "Johnstone." What a back for a saddle! "Mrs. Ridley," the property of Messrs. Dixon and Fairtlough, Carlisle, shows a very first-rate style. This fine old-fashioned mare is fitted to breed the truest kind of hunting stock; splendid arms and thighs: her foal by Ravenhill. Mr. Patterson's "Lady Charlotte" is a roomy young mare, with a mild eye and a good head; great reach of hind-quarters: fine foal by Ravenhill. A fine aged mare, "Miss Hudson," Mr. C. Pybus, of Catterick, being owner, very much commended herself to our notice. We very much approve her fashion—good withers, admirable legs.

CLASS IV.—*Three-year-old Geldings for Hunting.*

Mr. Barton's "Young Yeoman," his sire being A British Yeoman, here takes the prize. Like his father, he has good legs, a short compact body, great reach of hind-quarters, a broad chest, &c.; he seems calculated to carry great weight. Mr. Barton is a coach-builder at Carlisle; he farms too, and is an amateur breeder: we hope that his present success may be an encouragement to him. Many of our best breeders have been those who have turned their attention to it, for the very love of the occupation, from other pursuits. Mr. Graham's gelding stands admirably—his crest up, and his eye bright; his top is very symmetrical. Mr. Watson's is calculated to carry a very heavy weight; he stands 15 h. 3 in. high, possesses great depth, fore-legs rather less substance than they should have. The other geldings are good, but not especially remarkable.

PIGS.

Reckoning pens of Sow-pigs as single entries, the numbers exhibited are as follows:—

Meeting.	Large Breed.	Small Breed.	Extra Stock.	Total Pigs.
Northampton. 1847	18	24	0	42
York 1848	36	93	8	137
Norwich 1849	22	65	4	91
Exeter..... 1850	26	88	1	115
Windsor 1851	64	104	0	168
Lewes 1852	48	96	0	144
Gloucester .. 1853	38	108	0	146
Lincoln 1854	45	92	0	137
Carlisle 1855	29	55	0	84
Average number at one show.....	36	81	1	107

In noticing the different classes, we shall just give the notes we jotted down respecting each pen as we passed it.

CLASS I.—*Boars of a Large Breed.*

No. 560. Mr. J. Farish's, of Dormansteads, near Carlisle, "Samson," 11 months old, Cumberland breed; white, with a few grey spots. Not thick enough in frame, or fine enough in bone; hair short. This hog not of very superior quality.

No. 561. Mr. John Unthank, of Netherscales, near Penrith, "Joney Bacon," 1 year 11 months and 2 weeks old, white. Disqualified: the judges being of opinion that this boar was entered in the wrong class. This is a very fine small-bred boar; long, broad, deep, symmetrical, of beautifully fine quality, and slender bone.

No. 562. Thomas Horsfall's, of Burley Hall, Otley, Yorkshire, "Young Hector," 2 years 10 months and 3 week, Yorkshire, white with patches. First prize. Rather short for his great thickness and depth; measuring 2 yards to the root of the tail. A beautiful hog: not too fat.

No. 563. T. Horsfall's "Hector," sire of 562, 4 years and 10 months, Yorkshire, white. A fine boar, but has gone off very much.

No. 565. John Harrison's, jun., of Heaton Norris, Lancashire, "Cheerful," 4 months and 6 days. Disqualified—the state of dentition indicating over age. A wonderfully fat boar; level and thick.

No. 566. Charles Jackson's, of 49, Goodram-gate, York, "Highland Harry," 2 years and 1 month, Yorkshire, blue and white. Second prize. Immense chine; good fore-quarter; thick hams; short fine ears; long hair; not over-fed.

No. 567. G. E. Taylor's, of Oatlands, Leeds, "Oatlands," 4 months and 3 weeks, white. This boar exhibits remarkable growth: he has a long, straight, and broad back, and is of very good quality.

No. 568. G. E. Taylor's "Favourite," 11 months and 3 weeks, white. Small, but nicely formed.

CLASS II.—*Boars of a small breed.*

No. 570. Joseph Hindson's, of Barton House, Breck-road, Everton, Liverpool, "Young Sambo," 3 years and 3 weeks, improved Essex, black. Beautiful quality, but rather narrow loin.

No. 571. James Beattie's, of Newbie House, near Annan, Dumfries, "Grushie," 7 months and 3 weeks, small breed, white. Very thick, small boar.

No. 572. R. H. Watson's, of Bolton Park, near Wigton, "Cumberland," 1 year 10 months and 2 weeks, white. A large boar with straight back, equally broad all over. He has a thick neck-chine, deep hanging sides, possesses beautiful proportion in form, and his long fine hair, and almost delicate face and legs, betoken his beautiful quality.

No. 574. Mr. Watson's "Bolton," 7 months 2 weeks and 5 days, white. A boar so young must possess wonderful feeding-

properties to attain to such a made-up condition. In form he appears very compact, and well-filled out in all points.

No. 575. Jonathan Browne's, of The Height, near Wigton, Cumberland, "Thornby," 2 years and 1 month, small breed, white. Remarkably thick with good quarters, finely filled-out chine, and fine ears.

No. 576. George Turner's, of Barton, near Exeter, "Sambo," 1 year 9 months and 3 weeks, improved Essex, black. Second prize. Round and compact; well made-up in all points, but not excessively fat. He has small ears and fine bone.

No. 577. George Mangles', of Givendale, near Ripon, Yorkshire, "Ajax," 1 year and 3 weeks, Yorkshire breed, white. A beautiful, but small, animal; level, and thickly built.

No. 578. George Mangles' "King of Diamonds," 3 years and 4 months, small Yorkshire, white. Small; not particularly well-formed, but very fat.

No. 579. George Mangles' "Ace of Trumps," 2 years and 11 months, Yorkshire breed, white. This boar has a very broad flat back—perhaps a little falling-off at the rump.

No. 581. Edward Robinson, of Greenbank, Lymm, near Warrington, "Tommy," 2 years 3 months and 3 weeks, Salford breed, white and blue spots. Fat; has a low place in the back; a very fat neck-chine.

No. 582. Mr. John Taylor's, of Southwaite Green Mill, near Penrith, "Charley," 4 years and 1 month, Cumberland breed, white. Bad back; ribs sloping off like a house-roof; general character not good.

No. 583 Mr. John Alderson's, of Thornby, near Wigton, Cumberland, "Roger Racon," 11 months and 3 weeks, small breed. A flat, broad back, fine bone, and beautiful quality. Remarkable size for so young an animal.

No. 584. Mr. John Birrell's, The Guards, near Gretna, Cumberland, "Black Diamond," 2 years 1 month and 2 weeks, Essex (Fisher Hobbs') breed, black. Very level, broad, well filled out; a very pretty boar.

No. 585. Mr. Henry Scott Hayward's, of Folkington, near Willingdon, Sussex, 8 months and 2 weeks, white. Disqualified, the state of dentition indicating over-age. A very small animal, but of beautiful quality.

No. 586. Mr. Thomas Horsfall's, 1 year 11 months, small Yorkshire, white with patches. Very short and thick, with a somewhat narrow hind-quarter.

No. 587. Mr. John Harrison's, jun., "Duke the Fourth," 5 months and 28 days, pure small breed, white and black. Small—neither wide nor deep enough; has a fine head.

No. 588. Mr. Dan. Leeming's, of Blackwood House, near Halifax, "Jolly Boy," 6 months, small breed, white. Not particularly well-formed, but long, and very largely grown for such a youthful age.

No. 589. Mr. William Hatton's, of Addington, near Otley, Yorkshire, "Young Cupid 2nd," 1 year 11 months and 3 weeks, small breed, white. First prize. Straight back; level, wide, and wonderful for depth. Has fine hair, beautifully fine snout and ears; altogether of remarkably good quality.

Class. III.—*Breeding Sows of a large breed.*

No. 590. Mr. James Farish's, of Dormansteads, near Carlisle, "Cumberland," 3 years and 8 months, Cumberland breed, white with a single grey spot. Commended. Great length, level back; has seven very fine young pigs.

No. 591. Rev. John Warburton's, of Kill, near Naas, Kildare, Ireland, "Rosaline," 2 years, Berkshire breed, black. Long, level, but not in any way remarkable.

No. 592. Mr. William Hodgson's, of Aspatria, Cumberland, "Duchess," large breed, white, 4 years and 2 weeks. Disqualified by the judges for having been entered in the wrong class. A very thick small-breed sow; well made; remarkably deep frame; square, full hind quarters.

No. 593. Mr. John Mackenzie's, of Barnhill, near Dumfries, 6 years and 3 months, Nottingham and Tamworth breed, black. Not level enough; otherwise a pretty good sow.

No. 594. Mr. John Richardson's, of Dalston, Carlisle, 1 year 5 months and 1 week, large breed, white. Straight back, of great length and depth, and extraordinary for her age.

No. 595. Mr. W. B. Wainman's, of Carhead, Cross Hills, Leeds, "Lady Airedale," 3 years 5 months and 2 weeks, improved Yorkshire breed, white. Commended. A lengthy, deep-made sow; very fat.

No. 596. Mr. Samuel Munro's, of 23, East Stanley-street, Salford, Lancaster, "Sally the Third," 1 year and 3 months, large breed, white. A good sow, but somewhat too narrow; 5 nice pigs.

No. 597. Mr. Dan. Leeming's "Lady of Halifax," 4 years 11 months and 3 weeks, pure large breed, blue and white. Large in frame, but neither deep nor level.

No. 598. Mr. John Palmer's, of Thorlby, near Skipton, Yorkshire, "Craven," 3 years 1 month 1 week, large breed, white. Short, thick sow: not straight and level enough.

No. 599. Mr. Thomas Horsfall's "Helena," 3 years 3 months 1 week, large Yorkshire breed, white. Highly commended. An immense animal; but not very fine in bone.

No. 600. Mr. Thomas Birkbeck's "Miss Fanny Bray," 1 year 11 months, improved white. Short, small, broad, round, and fat.

No. 601. Mr. John Harrison's, jun., "Miss Carswell," 1 year 11 months 6 days, pure large breed, white, with blue spots. First prize. A wonderful animal. Having immense length, great breadth, standing very high, and yet with a very deep, trailing belly. Very beautifully formed, and well filled out everywhere. Wonderfully fine offal; indeed, a very remarkable sow in every respect, for quality of flesh, feeding properties, and enormous size.

No. 602. Mr. John Harrison's, jun., "Peg," 10 months, large breed, white, with spots. Small sow, with nine fine young pigs.

No. 603. Mr. G. E. Taylor's "Jenny," 2 years 10 months, improved large breed, white. A large sow, not "made up." Good neck chine; deficient in hind quarters, and light, thin hams.

Class IV.—*Breeding Sows of a Small Breed.*

No. 604. Mr. Joseph Hindson's "Impudence," 2 years 3 weeks, improved Essex, black. A sow of good quality, having eight very large and handsome pigs; but five out of the eight are much smaller, and of darker colour than the last.

No. 606. Mr. William Lancaster's, of Lazonby Coat Hill, near Penrith, Cumberland, "Queen," 2 years 1 month 2 weeks, small breed, white. Disqualified by the judges, for having been entered in the wrong class. A long, thin sow, large-eared.

No. 607. Mr. R. H. Watson's "Miss West," 1 year 10 months 2 weeks, small breed, white. Prize. Not very great in size; but straight, level, broad, of great girth, and very deep.

No. 608. Mr. William Brown's, of Kirkhampton, near Carlisle, "Flower Pot," 9½ months, small breed, white. Small, but beautiful in form, and of fine quality.

No. 609. Mr. George Turner's, of Barton, near Exeter, 1 year 10 months 2 weeks, improved Essex, black. Highly commended. Of beautiful shape, and uncommonly good quality.

No. 610. Mr. Isaac Fisher's, of Law Butler, near Appleby, Westmoreland, "Lady Westmoreland," 2 years 9 months 1 week, white. Level, broad, and fine in character.

No. 611. Mr. William Jopson's, of High House, Staveley, near Kendal, "Miss Windsor," 4 years 10 months, Coleshill breed, white. Specially commended. A very thickly-made, level, and exceedingly well-formed sow, having good hams, and a remarkably full neck chine. A placard was posted up over this pen—"Unwell. Please not to disturb this pig."

No. 612. Mr. John Mackenzie's "Old Favourite," supposed to be about 4 years 9 months, Leicestershire breed, white. Short, thick, fat.

No. 613. Mr. George Mangles' "Queen of Hearts," 2 years 11 months, Yorkshire breed, white. Small sow, with nine tremendous pigs 14 weeks old.

No. 614. Mr. George Mangles' "2nd Queen of Diamonds," 1 year 2 months and 2 weeks, Yorkshire breed, white. Commended. Small, short, of fine feeding quality, but completely round with fat.

No. 615. Mr. Edward Robinson's, of Greenbank, Lymm, near Warrington, "Miss Betsy," 1 year 7 months and 1 week, Salford breed, white. Thin and lank; with 4 young pigs.

No. 616. Mr. David Doughty's, of Carronfoot, Thornhill, near Dumfries, 12 months and 1 week, Leicester and Cumberland breed, white. Small sow, with rather narrow loin, and not a good neck-chine.

No. 617. Mr. John Taylor's, of Southwaite Green Mill, near Penrith, "Lily," 11 months and 1 week, Cumberland breed, white. This sow has a hollow place in her back, has fine bone, but her ears not very short. Very fat.

No. 619. Mr. John Birrell's, of Guards, near Gretna, Cumberland, 2 years 1 month and 2 weeks, Essex breed, black. A noble-looking sow, of great girth; well filled out in all parts, perhaps a little falling off towards the tail.

No. 620. Mr. Samuel Munro's, of 23, East Stanley-street, Salford, Lancaster, "Mary Ann," 1 year, small breed, white and black. A tolerably good sow, having 6 pigs of very unequal size.

No. 621. Mr. Dan Leeming's "England's Glory," 4 years and 10 months, pure small breed, white. Very great length, but not thick enough in proportion.

No. 622. Mr. Henry Scott Hayward's, 10 months and 2 weeks, white. Commended. Small, straight, level, thick, deep, wonderfully fat, bone slender, but hair long, and quite fine enough.

No. 623. Mr. Thomas Horsfall's, 1 year and 11 months, small Yorkshire breed, white, with patches. Over fed. Not particularly straight or well-formed.

No. 624. Mr. Thomas Horsfall's, 1 year and 11 months, small Yorkshire breed, white, with patches. Small, short, thick. A very well-made sow, with 3 large fine pigs.

No. 625. Mr. Thomas Horsfall's, 1 year 5 months and 3 weeks, small Yorkshire, white. Highly commended. A sow of very beautiful quality, thick, and level. 2 fine pigs.

No. 626. Mr. Thomas Horsfall's "Yorkie," 2 years 5 months and 2 weeks, small Yorkshire, white, with blue patches. A short sow, with 3 pigs almost as large as herself.

No. 630. Mr. John Hitchman's, M.D. (on behalf of the Committee of the Derby County Asylum), Mickleover, near Derby, "Young Symmetry," 1 year 8 months and 3 weeks, Suffolk breed, white. Not of particularly great merit in any respect.

Class V.—*Three Breeding Sow Pigs of a Large Breed.*

No 631. Mr. Jonathan Brown's, of The Height, near Wigton, Cumberland, pen of three, 6 months 1 week and 4 days, large breed; two white, one with a blue spot. Straight, level, and of good quality; very forward for their age.

No. 632. W. B. Waiuman's pen of three, 4 months and 2 days, improved Yorkshire breed, white. Highly commended. Thin, but of fine quality; nice pigs, but scarcely worth the commendation, unless for their great length, and growth in so short a time.

No. 633. Samuel Munro's pen of three, 7 months 3 weeks, large breed, white with black spots. Disqualified; the state of the dentition indicating over age. Three very large, thick, fat animals.

No. 635. William James Sadler's, of Bentham Purton, near Swindon, pen of three, 7 months 2 days, pure Berkshire breed, black and white. Prize. Beautiful symmetry; level, round, not too fat; fine bone; and beautifully fine black hair. These are remarkably superior animals.

Class VI.—*Three Breeding Sow Pigs of a Small Breed.*

No. 636. R. H. Watson's pen of three, 7 months 2 weeks 5 days, small breed, white. Prize. Wonderfully fat, thick, well made, and of very superior quality.

No. 637. Jonathan Brown's pen of three, 6 months 2 weeks, small, breed, white. Highly commended. Short, small, fine.

No. 638. George Mangles' pen of three, 4 months 3 weeks, Yorkshire breed, white. Little, but of good character, and very fine quality.

No. 639. The Earl of Radnor's, of Coleshill House, near Highworth, pen of three, 4 months 2 weeks, Coleshill breed, white. Very thick, well shaped, and extremely forward. Not an even lot, one being shorter than the others.

No. 641. William Tod's, of Elphinstone Tower, near Tranent, East Lothian, pen of three, 6 months 1 week, small breed, white. Disqualified; the state of the dentition indicating over age. Good pigs, but not of particularly kind quality.

No. 642. John Palmer's, of Thorlby, near Skipton, Yorkshire, a pen of three, 6 months 1 week, small breed, white. Not very level backs, not fed up, but of pretty fair quality.

No. 643. Henry Scott Hayward's pen of three, 5 months 3 days, one white, two white with small blue spots. Nothing particular, not very well shaped, not thick enough; neck-chine rather deficient.

POULTRY.

At Northampton, three lots of *cheese* were exhibited as "Extra Stock;" at Lincoln, there were 25 sets of long-wool *fleeces*, in a special class; and as a still more striking novelty, a Cochin-China cock and hens were first shown at York as "Extra *extra* Stock!" Poultry, however, at Lewes, obtained their right to appear in a special class among the farmer's live stock, and the number of entries then and since has been as follows:—

Meeting.	Fowls.	Turkeys.	Geese.	Ducks.	Total Poultry.
1852, Lewes	58	1	5	11	75
1853, Gloucester	229	7	25	31	297
1854, Lincoln.....	245	7	11	32	295
1855, Carlisle.....	156	0	5	24	185
Average at one show..	172	4	11	24	212

The Dorkings, the most serviceable of all these breeds, show as well or better at Carlisle than they have ever done at any of the Society's meetings. We heard many breeders and farmers' wives commenting with delight upon their short legs, broad breasts, small proportion of offal, and large quantity of good profitable flesh; and the lovers of plumage should be enraptured with their gorgeous hues, which their square-built forms display to the best advantage. Examples of these are seen in the 2nd and 3rd classes, in those birds belonging to Messrs. Davis, of Spring Grove, Hounslow; Geldherd, of Kendal; Hitchman, of Derby; Ullock, of Windermere; Harrison, of Kendal; and Mrs. Townley Parker, of Chorley. In the 1st class, chickens of 1855, Mr. Davis, Miss Bell, and Mr. Geldherd were successful, the latter gentleman taking two prizes.

The Spanish fowls, with their cavalier strut, are not so good as we have seen them. Ranking first amongst poultry, as table birds, it is well to cultivate them, and particularly so as they are very prolific, and easy to feed. The stocks of Captain Hornby and Mr. Edward Bond are in high repute. There are none of Mr. Bond's here; there are three bred by Captain Hornby, one of which, the property of Mr. Lightfoot, Newcastle, takes the 2nd prize. He also takes the 4th; while Mr. Davis takes the 1st, Miss Bell the 3rd, and Mr. Dixon, of Bradford, the only prize awarded to Spanish cocks.

The Cochin China stand is another illustration of the "love and leave me" failing of the English public. This poor bird, obedient to the behests of breeders, has been brought into a condition of lamentable deformity; has been idolised; and the humour for lionization having lasted its little hour, we see it ridiculed, and in its last stage of abandonment. Mrs. Mary Parke, of Brampton, takes the 1st prize; Mr. Blaylock, Mr. Dobson, and Mr. Geldherd, the 2nd, 3rd, and 4th, in succession, the latter gentleman receiving the 1st in the 2nd class.

The class for Brahmah Poutra Fowls has only three entries, and Mr. Davis, of Hounslow, receives the only premium awarded.

The Game fowls, beautiful to look at, excellent to eat, admirable sitters and mothers, are well represented here on the whole. Mr. Pickthall, of Kendal, takes the 2nd prize in the 1st, and the 1st in the 2nd class. Mr. Tillerton, of Birmingham, and Mr. Ellison, of Milnthorpe, receiving respectively the 1st and 3rd awards.

For the present arrangement of the Hamburg fowls we are indebted to Mr. Dixon. There are several distinct races, all partaking of one common type; their size is moderate; they are non-sitters, very fertile of eggs, and good table birds. Mr. James Dixon's birds display the best breeding, although there is great merit in Mr. Harrison's, Mr. Fletcher's, and Mr. Sharp's, all of which gentlemen receive prizes.

The Malay fowl does not appear to be in very good esteem. The naturalist may value him more than the breeder, to whose service he is not suited. To Mr. Lort and Mr. Bolckow, are awarded the 1st and 2nd prizes.

The Poland, in his martial costume, is a fine bird, and valued particularly by epicures—Russia being one of the gourmands whose palate he tickles! Mr. Adkins and Mr. Bolckow show some splendid specimens of this bird, and bear away prizes one, two, and three.

The geese are bad. Mr. Ambler does something towards retrieving their character, but not much.

The ducks are better. Mr. Davis took two, and Mr. Geldherd one of the prizes awarded to Aylesbury ducks, and Mr. Fowler secured both prizes given to Rouen ducks. The prize for ducks of other varieties was awarded to Mr. Dixon. As a whole the show is not successful. At Newcastle they got together 287 birds; here we have but 185!

THE IMPLEMENT DEPARTMENT.

By way of exhibiting the progress of this department, we give the following list, showing the comparative numbers of implements, at the present and some former meetings, with the proportion of *new implements* in each class:—

Implements, &c.	Aver. number at 14 Shows, viz 1836 to 1849.	No. at Lincoln 1851.	No. at Carlisle 1855.	*New* Impls. at Lincoln, 1854.	*New* Impls. at Carlisle, 1855.
Number of Exhibiters..	135	130	118*		
Barley hummellers	4	10	3	1	0
Bean splitters	1	11	6	1	1
Blowing machines	3	9	0	0	0
Bone mills	1	2	0	0	0
Brick machines	1	3	2	3	1
Carts	53	22	9	4	5
Chaff cutters	69	33	22	4	8
Cheese presses.....	4	4	5	0	0
Churns.....	16	12	7	3	2
Clod crushers	11	11	8	2	3
Cooking apparatus	9	6	0	0	0
Corn dressing machines	23	24	18	2	4
Cultivators, &c.	44	25	23	4	2
Draining Implements ..	6	4	1	4	0
Draining tools.....	17	7	3	0	0
Drills	68	30	14	10	4
Fencing	42	11	3	1	0
Fire engines.....	4	6	3	0	0
Harness	13	4	3	1	0
Harrows	56	16	9	0	2
Haymaking machines ..	11	4	6	2	3
Horse hoes	36	21	10	3	2
Horse rakes.....	12	14	8	0	1
Linseed crushers.....	28	20	14	1	3
Manure distributors ..	4	9	3	4	1
Mowing machines	4	6	7	0	0
Oilcake breakers	15	20	12	4	3
Ploughs	114	27	19	3	4
Reaping machines	1	12	9	7	6
Rollers	26	13	9	1	0
Stable fittings	9	14	10	3	1
Steam engines.....	11	24	18	4	5
Straw shakers.....	2	3	0	0	0
Subsoilers	22	17	8	3	2
Thrashing machines ..	41	26	21	5	4
Tile machines	28	8	5	1	2
Turnip cutters, &c.....	19	18	20	4	10
Waggons.....	10	6	5	2	2
Miscellaneous	402	49	293	14	26
Total	1238	761	615	101	107

* Of which 57 are for the *first time*.

It will be observed that the decrease in number of articles shown at the last two meetings, as compared with the numbers several years ago, arises not from a less variety o implements, or a less number of exhibiters; but from a reduction of the many duplicate and redundant articles, as carts, chaff-cutters, drills, harrows, and ploughs. This is not to be regretted, as the Society's show-yard ought not to be made a warehouse for the convenience of manufacturers, and crowded with scores of perfectly similar carts, barrels of sheep-dipping composition, &c., which only encumber the stands, without affording any additional information to amateurs, or any larger assortment for the choice of purchasers.

The results of the trials of portable engines were as follows:—

Judges' Award.	Names of Exhibiters.	Horse-power.	Price.	Fuel consumed in getting up steam. Wood.	Fuel consumed in getting up steam. Coal.	Time occupied in getting up steam.	Coal burnt per hour.	Coal burnt per horse-power per hour.
			£	lbs.	lbs.	mins.	lbs.	lbs.
First Prize	Tuxford and Sons	8	250	24	28	66	29.584	3.698
Second Prize	Clayton and Shuttleworth..	8	260	24	18¼	44½	32.432	4.054
Highly commended	Barrett, Exall, and Andrewes	6	210	13	18¼	65	26.526	4.421
Highly commended	Hornsby	8	255	24	34½	39	38.712	4.839
Highly commended	Ransomes and Sims	7	230	21	26	55¼	35.388	5.054
Highly commended	Garrett and Sons	7	235	21	26	44	39.242	5.606
Commended	Croskill.....	6	220	18	30	66	48.48	8.08
Commended	Lee	7	180	21	35	43½	70	10

Fixed steam engines gave the subjoined results:

Judges' Award.	Names of Exhibiters.	Horse-power.	Price.	Coal burnt per hour.	Coal burnt per horse-power per hour.
			£	lbs.	lbs.
First Prize	Ransomes and Sims	8	193	46.184	5.773
Highly commended	Clayton and Shuttleworth ..	8	215	54.024	6.753
Second Prize	Barrett, Exall, and Andrewes	8	200	55.896	6.987
Highly commended	Tuxford and Sons	6	175	47.562	7.927
Commended	Dray and Co.	8	210	76.867	9.608
	Smith Brothers and Co....	8	133	94.672	11.834
	Johnson	4	110	64.812	16.203
	Gray and Co.	8	175*		

* The Society's boiler could not generate steam so fast as this engine wanted it for driving.

These tables, containing the economy of fuel, price, and opinion of the judges as to other merits, will be enough for the guidance of the farmer, without our entering into an engineer's critique of the boilers, fire-boxes, flues, and working parts of each engine. However, we shall add a description of two or three of the portable engines, seeing that this class of engine has lately been so much improved, and greatly praised by the authorities at Carlisle.

The eight-horse portable engine of Messrs. Tuxford and Sons took the first prize; and although a good duty was effected by several other of the competing engines, it distanced the second-best one by about 20 minutes, with 14lb. of coal to the horse-power, the actual time it ran with the 14lb. being 3 hours and 47 minutes, or less than 3¾lb. of coal per horse-power per hour. The construction of engine and boiler which effected this extraordinary duty was very simple, the boiler being a tubular one, with certain improvements made by the exhibiters, by which the tubes could be expeditiously and readily cleared from soot, without derangement to any portion of the engine. The engine was placed at the end of the boiler, beyond the smoke-box, and had its working parts enclosed in a house, with folding doors, all of plate-iron. The cylinder (a *vertical* one) was placed above the house, and had its position reversed, the stuffing-boxes to the piston and valves being on the lower or under side; in fact, instead of being an upright acting engine, it was a downright acting one. By means of an additional valve, apparently of very simple arrangement, the steam was made to act expansively. It would have been well had the water capacity of the different competing engines been ascertained; but this is a point overlooked in the trials. Judging from the fuel consumed in getting up the steam by the prize engine, which was in excess of most, if not all, the other engines on trial, it is only reasonable to conclude that its water capacity was greater (in proportion, at least), as its consumption of fuel in getting up steam exceeded that of other engines. The workmanship of both engine and boiler, and uniformity of action throughout the trial, elicited marked attention from both judges and spectators. We must say, however, that, for durability under farmyard management, we should prefer one of Messrs. Tuxford's water-space flue boilers to this tubular one.

Messrs. Clayton and Shuttleworth's eight-horse engine was certainly a very superior piece of machinery, and most deservedly took the second prize. The patented improvements of this engine consist in a new method of heating the exterior surfaces of the cylinder and slide-box, thereby effecting a saving of fuel. The cylinder is placed in a jacket, the space between the two being filled with steam, while the outer surface of the jacket, by being placed in the smoke-box, is surrounded by heat of 400 degrees and upwards, thereby preventing any loss by radiation, which cannot be the case when the cylinder is placed in the steam-chamber of the boiler, inasmuch as the boiler must be increased in its external dimensions to receive the cylinder, thereby increasing its radiating surface.

Messrs. Hornsby and Son have long enjoyed the credit of having produced, in 1851, the first engine consuming a very small amount of coal, and most deservedly so. By their patent arrangement, the cylinder and pipes connected with it are placed inside the steam-chamber, and are effectually protected from weather and frost at all times, preventing the possibility of condensation in the cylinder and pipes, and the injury frequently resulting from that cause. In all engines with the cylinder outside the boiler, the water in the cylinder, pipes, and pump, in the winter frequently becomes frozen: and if even great care is taken by the person in attendance on the engine, injury is often done; and if not, much time is lost. These are evils which never can occur in the patent engines. A great saving of fuel is also effected, which is one of the most essential points in a portable engine; for, in addition to the advantage in decreased cost of coal, the wear-and-tear of boiler and tubes is greatly diminished. It is worth noting that these three celebrated makers —Tuxford and Sons, Clayton and Shuttleworth, and Hornsby and Son—have brought the portable steam engine almost to perfection in a purely *agricultural* county; and Lincolnshire deserves high credit for supporting such firms by its patronage, no less than it receives honour from the presence of these distinguished inventors and manufacturers within its borders.

FIXED AND PORTABLE THRASHING MACHINES AND CORN-DRESSING MACHINES.

Stand 19, Articles 13 and 14.—First we notice those justly-celebrated manufacturers the Messrs. Garrett's portable combined thrashing and winnowing machine, which has many important improvements—one of the greatest being the introduction of an intermediate shaft, supported on the frame of the machine to which the engine is attached, and this shaft carries the necessary pulleys for driving the drum and other working parts of the machine. The power, by means of this arrangement, is applied nearer the ground, contributing very much to the steady working of the machine. Price £104. Messrs. Garrett have also exhibited a portable combined thrashing and screening machine, for steam power. It is fitted with a patent straw-shaker and screen for steam-power;

the straw-shaker effectually separating the corn from the straw, and the screen riddling away loose ears, short straws, rubbish, and calder from the corn and chaff, which are delivered by a spout at the side of the machine, the straw at one end and the cavings at the other. It is also fitted with a drum of a novel and peculiar construction, made of wrought-iron throughout, having an improved form of beater, which reduces the draught and prevents any injury to the corn. Price £66.

Stand 24, Article 2.—The shaker consisting of an endless web, formed by slats of wood, two feet in length, lying horizontally at intervals of six inches, and attached at either end to woollen bands, is the feature of "improvement." Here we use the term "improvement," because the makers, Messrs. Williamson, do; not because we deem it a right term to use. This form of shaker we think especially liable to choke. The chief recommendation of this machine is its price—£20.

Stand 26, Article 4.—For this portable combined thrashing, shaking, and dressing machine Messrs. Hornsby obtained the first prize of £20. Besides the attainment of a general completeness, we have to notice a few decidedly new introductions. The riddle, upon which the corn is delivered from a screw, which nicely regulates the quantity, is of a new construction. It consists of Venetian slatting, there being between each slat a strong wire, and there are transverse bars sufficiently raised to carry the coarser cavings without their coming in contact with the wire. The shaker is, like Garrett's, inclined, but not in so great a degree. There are iron fingers attached to the rails, that catch the straw and bring it forward, always keeping it in a light free state. The beaters of the drum are composed of hollow cylindrical tubes of wrought-iron, combining lightness with strength, and admitting of the concave being adjusted so closely to the revolving thrashing surface as to insure the thorough *stripping* of the ear without injury to the grain. The blasts are very well arranged. This machine does not finish the dressing, but Messrs. Hornsby have made a winnower, intended to be an auxiliary to this, which will be noticed hereafter. The price of this machine is £100. The bearings seem to be rather numerous and the details complicated.

Stand 30, Articles 5 and 6.—Messrs. Barrett, Exall, and Andrewes—a firm taking rank among the leading manufacturers of the age—exhibit a seven-horse power portable combined thrashing and dressing machine, value £105. The improvements here consist in affording facility for a greater number of separations than is usual, by a simple arrangement. You have head corn ready for market, 1st and 2nd tailings, and seeds and puds, each delivered in sacks. We remarked but few bearings, and found one cause of this reduction to be the abandonment of the crank specially for the riddles, which now are worked off the same crank as the shaker: this is an improvement. The drum is wrought-iron and the beaters are hollow. The intensity of the blast is made well to accord with the speed of the drum. The motion is, we think, thrown too much to one end of the machine, so that more or less rocking may be expected. There is no recommendation card here it is true; but the machine we think one of great merit notwithstanding, for the last-named defect is easily obviated. Article 6 is a similar implement, having an additional horse power. Price £95.

Article 7. — The well-known two-horse portable thrashing machine, and patent safety horse-gear, belonging to the same gentlemen, is further improved. It is a valuable implement on small holdings, costing but £40 in all. It is simple and light, and has won the makers several prizes.

Stand 31, Article 9.—Messrs. Clayton, Shuttleworth, and Co., the largest manufacturers in Lincolnshire, exhibit a combined portable thrashing and corn dressing machine, which they designate a "new implement." As it is those principally that are so designated that we notice, we stop here. This machine is pretty much the same as was exhibited last year, saving one most important addition: this is the addition of an invention of Mr. Nalder, Alverscote, Lechlade, which that gentleman has patented. By this invention added to their implement, Clayton and Shuttleworth produce a very perfect sample for market. The mechanism of this perfecting addition is as follows:—After the corn has passed the hummeller into a hopper, it is raised by elevators and thrown into a slanting cylindrical rotary screen, which revolves against and is kept clean by a fixed brush that traverses its length at top. A fan, situated at the lower end of this screen, directs a blast upwards through it, driving out at the upper end all lighter impurities, the dust finding escape through the wires. As the grain is dismissed at the lower end, when it is nearest the blast, the final separation of tail is very nicely arranged for. It is very generally thought by those who have given this invention much attention, that it will ultimately cause us to abandon the complication and rocking motion of the riddles we now use, and serve us more effectually than they do.

It is curious to know that this machine was disqualified for competing for the prize, by reason of having this very perfecting apparatus attached to it. In this, however, the society is consistent. At Lewes, the same anomaly occurred. Messrs. Garrett's fixed thrashing machine did what was required of it by the *conditions of the prize sheet*, while Messrs. Clayton and Shuttleworth's did more: Garrett's took the prize, and Clayton's was recommended for the gold medal. Now Hornsby takes the prize, and a silver medal is awarded to Clayton and Co. Whether this is a judicious course is another thing altogether. Nalder's invention may be added to the machines sent out by this company last year for the sum of £15. We certainly should like to see fewer running bearings, and less complication if possible. Goucher's patent beater is still adhered to. The price £115.

Stand 38, Article 2.—This machine, exhibited by Messrs. Holmes and Sons, is improved since it won the first prize-medal at the Exhibition of 1851. The shaker is formed of four boxes, having perforated plates in the top surface, through which the corn is shaken, and delivered to the riddle. This arrangement certainly keeps the crank-bearings under the shaker free from dust. We were pleased to observe that much attention had been paid to the reduction of friction to a minimum. The working bearings are less in number than in any of the machines we have mentioned of this class, and well arranged. The shaker, riddle, and dressing apparatus are driven by a counter-shaft direct from the engine, at the speed they require, having no connection with the drum-shaft, which, with its bearings, is driven independently. The power which is lost in most cases between these two (it has generally to be reduced one-fourth between the thrashing and the dressing apparatus) is here economized, and an increased steadiness is gained. Complete with weighing apparatus, the price is £115.

Stand 53, Articles 1 and 2.—This combined thrashing and winnowing machine, exhibited by Messrs. E. and T. Humphreys, is highly commended. It possesses a very popular merit—that of cheapness. It does a good stroke of work, and turns out a fair rough sample. The beaters are similar to Goucher's, but not ribbed. The riddle is the chief improvement. Its bottom is stout two-inch boarding, with holes perforated in a

slanting direction; so that each forms a sort of cylinder, through which, the fan being beneath, the blast is directed with great effect. We like this form of roughing riddle better than Hornsby's. All seems snug and compact; and the vibrating trough is so divided as to balance itself, and the strain on the crank-shaft and bearings is consequently much mitigated.

Stand 61, Article 6.—This machine was exhibited by Messrs. Tuxford, of Boston, who are the inventors and makers. The elevators are fixed within the framework; so that, beyond placing the driving-straps on the different pulleys, after its being set in the yard, no other attachments had to be made. The extreme simplicity of the shaker, which is in one piece, and has but one driving motion (the nature of which motion is the only doubtful point in the machine), caused it to be elevated during the trial for ascertaining with the greatest nicety if, with its simplicity, it could be really effective as a shaker. The dressing part consists of one set of fans, three corn riddles, and one chaff screen, with a perforated apron of a curved form extending across the machine, and above the chaff screen, for the purpose of diverting the chaff from the line of blast down upon the screen, while the blast itself passes through the perforation of the apron out of the tail of the machine. The three riddles and screen, and their proper adjuncts, are all fixed on one large shoe or hopper, and are placed below the shaker, one motion giving action to the whole. The fans have, at proper angles, boards for splitting the draft, giving to each riddle a separate portion, and thus in effect dressing the corn three times. The separation of its proceeds of thrashing are very distinct. 1st, *the dressed corn* is carried away by elevators, and discharged into a hopper at the top of the machine, from whence it is delivered into sacks upon a platform for a man to back; 2nd, *the tailings* to themselves; 3rd, *the chaff*; 4th, *the cavings*, &c.; and 5th, beyond them the mass of *long straw*; so that the whole of the processes are completed from the centre line of the machine to its tail, whilst the sacking of the grain takes place at the opposite end near the engine. In the case of barley, instead of its being passed into sacks, like the wheat, it may run in addition through the aveller, and then be delivered to sacks at a corresponding height with the wheat. This aveller possesses a simple self-adjusting apparatus, by which a certain amount of pressure can always be maintained upon the grain within it, the quality of the work being thus gauged with the greatest nicety. The price is £95.

Stand 95, Article 61.—A patent four-horse power portable thrashing machine, with shaker and riddles, manufactured by Messrs. Ransomes and Sims, to which a prize of £20 is awarded. The price of this implement is £90. It is fitted with what in our opinion is a defective sort of shaker, namely, "Brinsmead's patent." This consists of a number of horizontal three-sided bars, with bent iron fingers inserted at the angles of the bars, at regular distances. These bars revolve, and the fingers interwork. The processes it is intended to facilitate are three—1st, to separate the grain from the straw; 2nd, to collect all the short straw that has fallen down with the grain, driving it out with the long straw; 3rd, to convey the grain back under the machine to the place where it is winnowed. This looks well in theory, but it does not work well. There is a needless dust and confusion created by the back movement, the cavings being caught up from beneath and thrown about when they should be done with. But while the shaker is open to objection on this ground, yet the motion conduces much more to the endurance of the machine than that of any of the other shakers in the yard. We have further to observe that the principal recommendation of this machine is that *all the movements are rotary*. The rocking vibrations inseparable from the reciprocating motion of the old machine, are here obviated. This wear and tear being reduced, the frame may be more lightly constructed, and similarly the friction being diminished, there is less power required. The judges at Lincoln say in their report of one of these machines: "In steadiness whilst working, the machine of Messrs. Ransomes and Sims was superior to all others, as the working parts are rotary, and vibration completely avoided." The riddling is performed in a circular riddle, and the grain thus falls through the meshes, whilst the refuse is turned out at one end of the sieve by the sliner, which consists of a number of prongs arranged helically on a shaft. This is Wm. Worby's patent. We venture to recommend this firm to adapt to their machines the still better patent of Mr. Nalder's, to which we have referred (Stand 31, Article 9); and we urge them by all means to keep to their *rotary* motions, by no means returning to those that are reciproctory. In the smaller machine we like the notion of placing the second motion for attaining the proper speed, between the horse track and the barn works.

Stand 65, Article 8.—Mr. Whitehead shows a very cheap and effective little thrashing machine, and four-horse power works, price £44. The new feature here is the introduction of a catch-box to the fan-wheel, by which the motion communicated by the horse works can be instantly stopped. It is a fixture.

Stand 88, Article 2.—Mr. Grey's Scotch two-horse fixed thrashing machine, made principally of iron, struck us as very simple and cheap. Those who like the Scotch model will like this. Price £40.

And now, with respect to the "Fixed Thrashing Machines, not exceeding Eight-horse Power, with Shakers, Riddle, and Winnower, preparing the corn for Market, being driven by Steam," all we have time to say is that there were three competitors—Messrs. Clayton and Co., Messrs. Ransomes and Co., and Messrs. Garrett and Co. The trial was going on until a few hours before the breaking up of the meeting; for on Friday, at noon only, the prize was declared—Clayton and Shuttleworth having kept the lead until the finish. There was not much difference in the work done. The price is the same within £3 (Garrett's being £147).

CORN-DRESSING MACHINES.

The first winnower we come upon is Archbold's, of Horsley, Tyne-side. The only novel appliance we remarked about it was a large woollen-covered roller, revolving at the bottom of the screen. The corn, in falling upon this, is separated from what hariff it may have mixed with it.

The next article, which is deserving of more attention, is exhibited by Robert Roby, Bury-St.-Edmunds. The improvement here consists in a deeper riddle-box than is ordinarily seen, which enables the inventor to apply a board, in continuation of the blower, under the top riddle, obliquely, so as to increase the power of the blast, and at the same time to guide the clean corn at once to the back of the fine riddle beneath, the entire surface of which it must traverse. The screen is quite a new invention, and patented. It is composed of a quantity of wires placed horizontally in notches, cut by an engine mathematically true, and placed upon a frame, in an oblique direction. It is fitted with rollers, and worked backwards and forwards by means of a crank, in the usual way. The possibility of blocking is prevented by the introduction of a thin iron collar between each wire, which has the effect of giving to the

corn a longitudinal direction, and completely deprives it of all the thin kernels, and affords the means of obtaining a most faultless sample. This screen is expensive, and adds so much to the cost of the machine, that few farmers will purchase it, we fear. But for maltsters here is a screen especially made, costing £6; and while the high duty on malt makes it necessary that they should use only the best barley, they will find here a very valuable servitor.

From this we pass to Hornsby's prize dresser. This is to be used in conjunction with their prize thrashing machine. It is fitted to perform an incredible amount of work, is simple, and cheap, the price being £11 10s. One of the old machines is also shown, with its appliances much improved—its joints less complicated, its mode of shifting the parts, and regulating both motion and blast, greatly perfected.

Upon Messrs. Dray and Co.'s stand, which was very extensive, comprising about one hundred different articles, we observed a curious little implement called a seed-separator. The inventor of this is Mr. Salmon, an American. His machine has obtained for him much fame in his own country, and the first of the three prizes awarded to agricultural implements at the New York Exhibition of 1852. Here, he receives a silver medal. Its novelty consists in the mechanical arrangement of the blast and sieve. The fan is made of iron, 16 inches in diameter and 22 inches long, and is placed in an air-tight trunk at the bottom of the frame, 26 inches wide, 3 feet long, and 4 feet high. The fan is driven by a cog-wheel 2 feet in diameter, which gives it a great velocity, sending the air up the trunk through which the grain is falling into the sieve, the dust escaping with the air at the head of the trunk, which is partly covered with a wire sieve. The screenings fall through the mouth of this trunk, free from dust and dirt, while the good grain falls through the blast into a receiver at bottom. The sieves are so arranged, that the heavy seeds, such as cockle, red-root, &c., are taken out without the aid of the blast. There are from two to six sieves for different seeds, one only being used at a time. The sieves are jogged in front by a cam and spring, instead of sideway shaking. It separates the oats from the peas, beans from wheat, clover from timothy. It will take clover-seed, grass-seed, and wheat, separating all three at one operation. We ourselves saw a peck of the most hopeless mixture thrown into the hopper, out of which came wheat and peas, and clover-seed and cockle, and split wheat, all duly separated. Where the specific gravity of two seeds is in ever so slight a degree different, separation can be effected. Messrs. Dray and Co. have undertaken to introduce this valuable machine into this country, and no doubt can be entertained of their success. Price £10.

Messrs. Holmes, of Norwich, exhibit a very effective dressing machine on wheels, intended for small occupations, price £5 17s. 6d. It will dress from 160 to 200 bushels per day of ten hours.

Mr. Nicholson, of Newark, has four winnowers here. That for small occupations, price £8 8s., is highly commended. The workmanship struck us as very good, and the details are simple.

Mr. Richardson, of Carlisle, shows a good machine, at a small price—£6 10s.

Messrs. Mapplebeck and Co., Birmingham, exhibit a cheap, simple, easily-worked dresser, price £7.

Mr. Smith, of Kettering, shows a capital method of splitting the blast, by which means the corn is divided to a great nicety. There is beneath the roller a moveable sliding divider, which is easily adjusted to regulate your blast as required. Price £10 10s.

Mr. Caborn's does not effect the purpose quite so well, and is more expensive. Price £14.

The effectiveness, simplicity, and cheapness (£7) of Mr. Bunting's winnower procured for it a well-deserved and high commendation.

REAPING MACHINES.

The reaper shown by Lord Kinnaird and J. Burry, of Rossie Priory, near Inchture, Perth, N. B., is M'Cormick's with his lordship's improvements. These consist of a self-acting side-delivery, by means of an endless cloth attached to chains, &c.—the principal difference between this machine and Crosskill's being that the horses walk before it on one side, instead of directly behind: for ready guidance we confess to liking this plan. Price £31 10s.

Crosskill's reaper, as is well known, is a great improvement upon Bell's original one—the principal improvements that have been made being in the starting gear, the framework and general construction of the machine, the fan, and the mode of suspending it, and the substitution of serrated cutters in place of the shears. The effect of the last alteration is to make the machine work with considerably less power, and the serrated knives are also lighter, and less liable to get out of order than the shears. It cuts a width of 6 ft. 9 in.; the corn is delivered sideways by an endless web; and the steerage is effected by the pole to which the horses are attached, a man following to hold and guide it. Price £42.

Burgess and Key's reaping machine is M'Cormick's greatly improved, and fitted with a patent Archimedian-screw platform, this consisting of three horizontal zinc worms, which cause the corn to pass off at one side. It is considered a very dangerous rival in the forthcoming trials at Bristol, and has given great satisfaction in the Paris trials. Price £35.

Dray's "Hussey" has so often of late been described in our columns, that we need only say here, that it has been still further improved; that its work was amongst the most complete of any of the machines tried, and that it looks well for again taking the prize it so successfully contested for last year at Lincoln.

Palmer's reaping machine is fitted with friction-rollers upon the platform. The chief points of excellence in the machine are: The cutting arrangement is easy to drive, and does not choke. With conical rollers on the side delivery platform, and parallel rollers on the back delivery platform, the delivery of the corn is neither difficult nor laborious to the man upon the machine. The draught is light for a pair of horses, and there is no side draught against them, or weight upon their necks, the machine being evenly balanced. The knife cuts in the centre of the driving wheel; hence in passing over ridge and furrow, the stubble is cut of uniform height. Price £25; or with side delivery, £30.

Harkes' reaper consists of a rotary drum, with a circular knife at bottom—the wheels and necessary gearing inside the drum causing it to revolve horizontally, and thus cut the corn and lay it in a swathe. However desirable it may be to have a simple motion, it was plain from the trial of this machine that a rotary motion of this kind damages the work by its necessarily high velocity.

DRILLS.

Chandler's liquid-manure drill is well known, and it has received the prize. R. and J. Reeves, of Bratton, near Westbury, Wilts (the makers of it), have brought out some patent improvements. Instead of the buckets

acting after the fashion of a dredging machine, a number of small holes are made in the bottom of the cistern, and a revolving stirrer fitted with steel springs, which act as cleaners to the openings, enables the liquid to flow out, by continually scraping the sediment from above the holes; the thick matter, in fact, forms a valve, which is more or less removed as the stirrer revolves rapidly or slowly: the pace of the horses thus having a command over the quantity of the manure distributed. This quantity can be varied from 3 to 15 hogsheads per acre. The proposed advantages over Chandler's original drill are, its simple construction, little liability to derangement, and its lower price, being £22 16s., instead of £28.

Garrett's drills are so universally known, that a very brief description will be sufficient. The "general-purpose" drill, for which this firm receives the prize, and the drill for turnips and manure on the flat (which also has obtained the prize), are both fitted with a patented improved barrel for drilling small quantities of manure when required. This is, in fact, of the same form as Chambers' patent broadcast and manure distributor (invented by T. Chambers, jun., of Colkirk Hall, Fakenham) which received the prize last year at Lincoln, and is again similarly and justly distinguished at Carlisle. This machine is constructed upon an entirely new principle, and, instead of cups or fingers, consists of a barrel or cylinder formed of a series of rings, each having projecting notches (for the delivery of either highly comminuted or rough manure), which come in contact with scrapers placed behind. The pressure on these scrapers is very prettily regulated to the greatest nicety by moveable weights, according to the adhesiveness of the manure used. It is also fitted with a novel and excellent stirrer, which never fails to give a constant and regular delivery from the box to the barrel, however moist the contents of the box may be. It will sow from one bushel to any quantity required; and it is so easily adjusted by the slide, that even when at work the quantity can be varied according to the quality of the soil, to deposit more or less as required, and without the change of wheels. To all agriculturists using artificial manures we recommend this as a most efficient machine, and one that is daily being more needed from the now well-assured conviction, that manures never act so efficiently as when thoroughly incorporated with the soil. It has been used with complete success in the regular distribution of the most difficult manures, such as guano, blood manure, salt, nitrate of soda, &c.

Garrett's drill for turnips and manure on the ridge, their three-row economical seed and manure drill, and their ten-row corn and seed drill, received high commendation; and their seven-row lever corn and seed drill was also commended.

We may say, generally, that Messrs. Garrett have succeeded in maintaining simplicty of construction, in spite of the cumbrous and intricate machinery which seem to be too much demanded by farmers. They have the great merit of avoiding racks and pinions, endless screws, &c., where simple levers will suffice; and if the farmer must have two or three drills made into one heavy machine, he will here find the least liability to derangement and wear.

Hornsby's drills receive three prizes and two high commendations. The India-rubber delivery tubes are a great improvement upon the old tin cups; the mechanism for ensuring regularity of seeding, in spite of unlevel ground, is exceedingly clever, and the fore-carriage steerage, managed by a rack and pinion, is indeed very superior. The prize corn and seed drill on an improved principle has the following patent improvements:—The corn or seed box is supported in the centre, and by means of a screw at one end, can be raised or lowered endways as the drill travels, so that the box is kept quite level, when the drill is travelling on the side of a hill at an incline of one foot in six, ensuring as regular a delivery of corn or seed as if travelling on perfectly level ground.

Holmes and Son, of Norwich, exhibit some very good drills, having a newly-invented apparatus for raising and lowering one end of the seed box when working on a hill-side: one end only being lifted or depressed, the gearing-wheels (all at the other end) are thus left without any displacement. The small occupation drill obtains the prize. Their manure distributor (commended) has a clever contrivance for sliding the revolving stirrer, consisting simply of an *untrue* wheel.

Reeves and Son, of Stanwix, near Carlisle, showed a drill in which different speeds are obtained by means of a pinion and differential-toothed disc, upon the principle of the dividing-plate used in cutting the teeth in clock-wheels. Their broadcast sowing machine has a very ingenious slide for regulating the rate of delivery. The holes in the slider are shaped like a square, with another square of one-quarter the size added to one corner; so that these, in conjunction with large square holes in the seed box, afford a very great variety of sizes and shapes in the holes by which the seed escapes from the brushes.

Balls' presser drill consists of seven presser-wheels loose on the axle, so as to allow of easy turning; and a fore-carriage steerage enables it to be used upon pulverized land, as well as following the plough.

Howard's press drill is a very neat machine. It follows three ploughs; and after depositing the seed, covers it by means of small shares which split the crest of the furrows. A zinc roller and brush deliver out the seed with the utmost regularity, without reference to up or down hill; and the contrivances for throwing in and out of gear, raising and lowering the shares, &c., are exceedingly simple and easy. A swivel-tree is also attached to the shafts, by which the pinching of the horse's shoulders is prevented.

The drills shown by James Smyth and Sons, of Peasenhall, Suffolk, are excellent machines, in which we would particularly commend the simple means employed for altering the height of the seed box; this being lifted by a lever and chain, and supported by dies or iron blocks of different sizes, instead of by a screw, as usual. By this contrivance, the adjustment of the cog-wheels for different speeds is the easiest possible. We noticed, too, the simplicity of the lever slides for regulating the quantity of manure supplied to the cup-barrel.

PLOUGHS, &c.

A plough with a friction-wheel in place of a sliding-sole is exhibited by J. Hope, of Rigg, near Gretna, Dumfries. The wheel is bevilled, so that the last furrow may be easily taken up; but, in spite of its accurate adjustment, we cannot imagine that it would work well after a little wear.

Gray and Co., of Glasgow, show their parallel lever subsoil pulverizer, which is distinguished from all others by the peculiar position and form of its tines or pulverizers, three in number, which are placed diagonally in the frame; the arms of the first and last tines are inserted into horizontal mortises in the frame, and can be expanded or contracted at pleasure to the breadth of furrow required. By this novel arrangement of the tines, a considerable saving of power is gained, and at the same time the most complete disintegration of the subsoil

effected. The work of this implement is the same as if done with the fork, no part of the subsoil escaping the action of its pulverizers.

The various ploughs exhibited by Ransomes and Sims, Howard, Busby, Ball, and other makers, we need not here attempt to describe minutely; the best test for the farmer is the quality of the work done; and this is a point we have already dwelt upon in reporting the trials in the field.

Howard's subsoil pulverizer is a very improved and efficient implement, having two beams, by which great steadiness and strength are obtained. Price £6 10s.

Lord Beauclerk's subsoiler, manufactured by Ransomes and Sims, consists of a subsoil tine preceding the mould-board of a common plough, thus opening up the bottom of the furrow after (instead of before) the horses trample upon it. To pulverize the subsoil, a screw revolving horizontally in the earth is attached behind the subsoiling tine.

Cotgreave's ingenious trenching and subsoiling implement we have previously referred to.

Crosskill's clod-crusher appears in an improved form. Each alternate disc is 3 inches larger in diameter than the rest; and in order that all the discs may touch the earth when on the level, the holes in the larger discs are made considerably larger than those in the small ones. By this arrangement, the roller is as effective upon rough ground as if the discs were all of the same diameter; and the difference in their size, and the play given to every alternate ring, prevents them from revolving precisely together, and from being clogged by damp or sticky soil. £17 10s.

Stanley, of Peterborough, exhibits Cambridge's excellent press-wheel roller, with the addition of scoop-shaped cleaning scrapers, which is certainly an improvement.

Busby's clod-crusher and Norwegian-harrow combined, in which slats of wood defended with iron sledge over the mould turned up by the stirring teeth of the harrow, is a useful tool. The weight is half a ton, and 2 horses can work it comfortably. Price £6 6s.

J. Palmer, of Stockton-on-Tees, exhibits a new self-cleaning clod-crusher, invented by Mr. Patterson, of Beverley. The novelty of Patterson's clod-crusher consists in the employment of a straight axle with a series of cams or eccentrics upon it, for the purpose of placing each disc or part of which the roller is composed in a backward or forward position with regard to its neighbour. Price £18.

Bentall's patent harrows are of a novel description in two particulars. The first is the character of the iron of which they are constructed, this being double angle iron, rendering them stronger than when made of the same weight of square iron. The holes in the beams and bars are, in consequence of the construction of the iron, punched in a machine when the iron is cold: hence they can be made to a much greater truth than can be obtained by the ordinary process of manufacture. The second improvement consists in a keep being rivetted against the nut, which effectually prevents the nut turning or getting loose. The harrows are constructed in three parts, or patented zig-zag principle.

Bentall's broadshare and subsoil plough, it is perfectly unnecessary for us to describe or commend; it being so universally known and esteemed by all good farmers. It is certainly the cheapest and most efficient implement ever made for paring and scarifying, and the sale of 1,400 in a year (which, we understand, is now the rate of its manufacture) must tend amazingly to extend the practice of clean farming, and lighten the labour expenses of the farmer. Mr. Bentall studies to supply a cheap rather than a complicated implement, and he deserves the gratitude of English agriculturists, for combining this object with the production of tools the most useful and effectual.

Ball's cultivator is worthy of remark, as containing a very simple and easy principle of raising it out of work. By merely leaning upon the handles (which are like those of a plough), the front row of teeth are lifted out of the ground, and the hinder row elevated also at an angle.

STEAMING APPARATUS.

Richmond and Chandler have devoted much time and attention to their steaming apparatus, which is peculiarly adapted for steaming and boiling all kinds of roots, corn, hay, chaff, &c. It is fitted with round steam boiler, supply cistern, safety valve, water gauge, pipes, taps, &c.; with wrought-iron pans for vegetables, so constructed that they may be turned over to empty without removal from their places. The construction of this apparatus renders it perfectly safe, economical, and durable; and it can be managed by the most inexperienced person. It is not, perhaps, generally known that mouldy hay, having undergone the action of steam, loses all its noxious properties, thereby producing a more wholesome food, giving greater nourishment to the cattle, and yielding a superior quality of manure, which will increase the produce of the farm.

Richmond and Chandler's root washer consists of a trough, within which is a cylindrical cage, supported in bearings fitted to the sides of the trough, from which rises a curved rack. The spindle of the cylindrical cage is fitted with a pinion corresponding to the rack. The object of this arrangement is to raise out and readily discharge the vegetables when sufficiently washed. Price £4 4s.

Crosskill's Archimedian washer—that is, having a screw fitted inside it, for delivering the roots without lifting the barrel out of the water—is a very ready and simple machine; but a little higher in price, viz., £5 10s.

TURNIP-CUTTERS, &c.

The patent turnip-cutter, invented by Mr. E. Moody, and manufactured by Samuelson, of Banbury, and exhibited by Richmond and Chandler, was commended. It cuts the root by means of gouge-shaped steel knives, fixed on a revolving cylinder, into thin slips for mixing with hay or straw chaff. The clean slices are carried by the shoot into a basked, and the dirt falls in a separate heap under the machine. One man can turn it with ease, cutting from 50 to 60 bushels per hour.

Garrett's newly-invented root pulper (highly commended) is a very efficient machine. It consists of a pair of toothed or pointed rollers, something like those of an oilcake-breaker, added underneath a Gardner's turnip-cutter; and one roller revolves with double the speed of the other, so that the teeth (which intersect) clear themselves. The barrel of the cutter is made with only one set of knives, and the rollers pulp the slices as fast as the barrel can cut—that is, say 1 bushel per minute, with two men turning. Price £8 8s.

Moody's turnip-cutter, manufactured by Hugh Carson, was highly commended. This machine cuts turnips, mangold wurzel, carrots, and other bulbous roots into thin slips for mixing with hay or straw chaff. The clean slices are carried by the shoot into a basket, and the dirt falls in a separate heap under the machine. The machine may be turned easily by one man, cutting about

60 bushels of roots per hour; or if worked by horse or steam power, a much greater quantity may be obtained. It has 12 steel knives, gouge-shaped, which are very durable, and not liable to injury from stones or frozen turnips, &c. They are fixed to an iron cylinder, and when worn out may be procured of the maker, and fixed by an ordinary smith. The beneficial effects produced by feeding with thin-sliced turnips mixed with hay or straw chaff have been fully proved, both as regards economy in food, and the nutrition afforded to sheep and cattle; and the importance of obtaining the slices free from dirt is too well known to require remark here. Price £4 10s.

Fowler and Fry exhibit a root-grater, invented by Bushe and Barter, of Lismore, Ireland, in which a revolving disc tears the roots into shreds by means of small knives projecting at an angle. It is capable of doing 1 bushel per minute. Price £3 10s.

Samuelson shows his well-known Gardner's cutter, and also Gauntlett's pulper, which tears roots into long stripes or ribbons.

Frederick Phillips, of Brandon, Norfolk, exhibits his patent root-pulper, which has also been made with a vibrating plate instead of the shaking hopper. It received the prize, and may be pronounced one of the most efficient machines we possess for the purpose.

Barnard and Bishop's root-rasping machine reduces turnips to a very fine state of division, though the work appears to proceed rather slowly. Price £4 10s.

Kealy's root-slicing and pulping machines are also very useful and efficient.

Ransomes and Sims' bean-cutter we have before described. We now have to notice a very admirable improvement in the form of an oat mill. To the casual observer this mill appears just like the old oat mills, but much cheaper. To the inquirer it is at once apparent that the roller which cuts the oats is on a much superior principle to anything yet out, inasmuch as the cutting edge is formed of pure steel, which is supported at the back by cast-iron. This enables the manufacturers to harden the steel as much as can be done by fire and water, and the cast-iron not being susceptible of hardening by the same process, you get the toughness of the soft material supporting the keen cutting edge of the harder metal. Thus a very durable and excellent article is produced, and at a cheaper rate than could be done by the old process of making the cutting barrels of wrought-iron and then case-hardening them, an operation which was attended with much risk and expense. The other process, of making them of cast-iron and case-hardening them, produced an apparently good article but a very worthless one really, as the hardening was only skin-deep and soon wore away. Thus, then, the public are manifestly the gainers, inasmuch as they get by this patent invention a very superior article in durability at the same or less cost than they have been accustomed to pay for a very inferior article, and considering the immense importance of economising horse keep, and that it is an uncontrovertible fact that crushing oats does economise it to a very large extent, we think this improvement worthy of commendation.

HORSE-HOES.

Martin's revolving horse-hoe, or turnip thinner, may be said to be entirely thrown into the shade by Huckvale's simpler, cheaper, and more effective machine. This is now greatly improved by Messrs. Garrett, so that it takes two rows at a time. The sliding cut of its knives is far preferable to the chopping action of previous machines; but we doubt whether the vertical circular motion is best for the purpose. When (as is very often the case) the plants are below or on one side the summit of the ridge or drill, they must be in a great measure missed by the above turnip-thinners; but if the knives revolved in a nearly horizontal position, no such omission could take place. Perhaps this eminent firm may bring out an implement of the kind.

Mr. Busby shows some implements intended to facilitate the labour of taking up turnips, consisting of a horse-hoe for tailing the roots in the ground, and a hand-hoe for topping them; they are invented by Mr. Lister, of Dunsa Bank. The implement for tailing turnips has a frame placed upon three wheels—the first wheel is steered by a lever, the two hind wheels are upon a cranked axle, which by another lever raises or lowers the frame; to this frame are attached two steel knives that cut obliquely; each knife tails one row of turnips; three-quarters of an acre can be tailed in one hour with one horse, or six acres in eight hours. The following is the cost of manual labour:—Women topping six acres of turnips, 3s.; a man with implement tailing and raising six acres, 3s. Thus six acres cost 6s., or 1s. per acre, for manual labour, for making turnips ready to be thrown into carts by women and boys. From the rapidity with which these implements perform their work, the farmer is enabled to select fine weather, which is an important consideration, as any soil adhering to the turnip in a dry state is readily shaken off; the land is also less injured from cartage in dry weather. Price £6.

Busby's ridge horse-hoe, with three tines, and a harrow to follow, is an admirable implement. Commended. It is very simple and cheap, all made of wrought-iron, and the shares are of Swedish iron, hard as steel.

The steerage horse-hoe, of Smith of Kettering, is a very useful and valuable implement, being very easily guided. Price £7 10s.

A combined grubber and horse-hoe, exhibited by R. Sewell, of Longtown, Cumberland, obtained a commendation; consisting of a frame of teeth, suspended under a beam, which carries a wheel at its front and back ends; the depth is neatly regulated by a compressed lever. Price £4 10s.

Astbury and Bushell, of Bedford, show the universal horse-hoe, invented by Mr. R. H. Nicholls, which, in spite of its having obtained three premiums from provincial societies, we still regard as being a complicated machine, subject to clogging in working. A smaller wrought-iron horse-hoe, shown by the same firm, seemed to us a very good implement. It is made upon the same principle as the foregoing, that is, each hoe has an independent steerage, and being drawn by two wheels in front, the axle of which works upon a centre, it is guided very easily, and works with much steadiness. The price is £3 10s.

As a horse-hoe *for all purposes*, Garrett's prize implement continues to merit the palm; it is adapted to all the prevailing methods of drill culture, either for cleaning crops drilled on the level surface, or on ridges, the axletree being moveable at both ends, to suit the varied intervals between the rows of plants. Wheat, barley, beans, peas, oats, turnips, mangold, potatoes, carrots, and other grain and roots, may be hoed in a superior manner, at an expense of from 6d. to 1s. per acre. The work performed is much more perfect than that done by the hand hoe, the depth penetrated is greater, and as much as 10 to 15 acres per day may be done with a horse, a man, and a boy. Each hoe works on a separate lever, and is kept a uniform depth, by means of regulating keys; so that, however uneven the surface of the ground, the weeds are sure to be effectually

destroyed. The steerage affords a ready means of keeping the hoes between the rows of growing corn, as they may thereby be regulated with the greatest precision, perfectly scarifying the intervals, without the possibility of injuring the plants. This implement is fitted with a box, for the purpose of sowing clover and other seeds broadcast. The price is £17 10s., or with the seed engine, £21.

Phillips' "poppy and weed extirpator and atmospheric land cultivator" is a novel-looking implement in appearance—a sort of horse-rake, each tooth having three knife points. This implement has been used by the inventor upon his large farms with the most signal success. Since using it, he has had no occasion to hoe his wheats, but finds them sufficiently clean without; and all the best farmers in Norfolk are giving in to the opinion that it is a far superior method in cleaning the wheat crops to the old system of hoeing. By its gentle action in stirring the surface of the soil, it opens its pores to the fertilizing influence of the atmosphere, and enables it to abstract from it a portion of ammonia, to the great benefit of the growing crop; and this it does without injury to the growing plant. Also for lightening and opening the surface of hide-bound soils, for passing over root crops, whether on ridge or flat work, previous to setting out the plants or freshening them after they are set out; or for harrowing in small seeds, whether among growing crops or otherwise, it is a very valuable implement. As soon after the crop of corn is put into the soil as will just give time for the crop of weeds to strike —which they usually do before the corn emerges from the soil, according to the old adage, "Ill weeds grow apace"—just at this critical moment, when the seeds of poppies and other weeds are in a young and tender state, almost too small to be seen, and so delicate that the least disturbance destroys them—at this particular moment pass the extipator overwarp across the drills, and it will be found to have destroyed what would have been the future crop of weeds; at the same time, the beneficial effects of a fresh exposure of the soil to the influences of the atmosphere will be very sensibly perceived. The extirpator may be used again as soon as the crop is fairly out of the ground, and as many times afterwards as circumstances will admit of, till the crop becomes too high to be any longer operated upon. None will ever repent using it too often. In the case of root crops, it must not be used till the plant is well up and firmly established, and then use overwarp as before stated. The horse hoe should be used also between the ridges. Price £7 12s. 6d.

Smyth and Ashby's haymaker (highly commended) maintains its ground as a first-class implement. Its chief merits are that each tine-bar is fixed upon two arms, with two strong springs, being thus steadier and firmer than in any other machine; and the axle and bearings are so ingeniously contrived, as to preclude the possibility of hay wrapping round and clogging them.

Nicholson's new haymaker promises to become a very useful implement, and has been commended. Its merits consist in having fewer wearing and working parts, being lighter in draught, having less friction, and, of course, greater durability. The extra pinion usually required for the reverse action is dispensed with, and with it the principal cause of the machine getting out of order. There are two distinct sets of gear-work in each axle-box, a wheel and pinion of the usual kind for the forward motion, and an internal wheel and pinion for the reverse motion; thus the wear in this essential part must be diminished one-half, and still further from other improvements. There is a compact arrangement for raising or lowering the machine, according to the state of the crop and condition of ground. The joints by which the fork heads are attached to the fork wheels are simple and remarkably strong; and the arrangement of the springs, &c., is such as to allow the machine to be worked on uneven ground and in the heaviest crops. The machine is balanced so as to press as light on the horses' backs as possible. The axles and other wearing parts are made very durable by being carefully case-hardened. The methods of effecting any changes are simple, easy of access, readily comprehended, and quickly performed. Every possible precaution has been made to prevent the probability of the hay coiling round or lodging on any part of the machine. The use of W. N. Nicholson's patent wrought iron tubular shafts adds equally to the compactness and durability of the machine; and their non-liability to rot or decay is of undoubted advantage, compared with wood shafts. The simplicity of its construction allows the patent haymaking machine to be produced at a cost not exceeding that of the commonest implement brought before the public notice. The price is £13 13s.

Crosskill's new haymaker has an exceedingly good lowering apparatus; and an important improvement has been added, by which the motion can be instantaneously reversed. The weak point about this machine seems to be the board, which is set upright upon the shaft frame just behind the horse—intended to prevent the lodgment of hay upon the shafts.

Smith and Ashby's horse-rake is neat and effective; and its lifting leverage is remarkably simple and easy, though we do not admire the principle of introducing counterpoise weights into field machinery. The following improvements have been added to this horse-rake: —Caps have been fitted to the wheels to prevent the hay from winding about the axle; the teeth have been so arranged as to rest more upon their backs, which prevents all damage to the plant; a simple apparatus has been added, to regulate the height of the teeth at pleasure; the ends of the frame have been considerably strengthened, and steel teeth introduced in the place of iron. Price £7 10s.

Howard's steel-tooth horse-rake is perhaps the best yet produced. It has gained the two first prizes last offered by the Society; and, indeed, the first prize at every agricultural meeting where it has competed. There are no cast-iron heads, to which rake-teeth are usually attached; the lever-movement for raising the teeth is the simplest and easiest possible. The substitution of steel teeth for iron ones will be found a great improvement; they are much lighter as well as stronger, not liable to pull straight or get out of shape, will wear much longer, and on account of their lightness the power required to raise them is considerably lessened. The shaft irons are furnished with a joint and quadrant, by which the teeth may readily be altered, so as to rake upon their points, or set more or less off the ground. This method is to prevent the rake collecting the soil and rubbish with the corn, an objection frequently raised against the use of horse-rakes. The teeth being curved or sickle-formed, are much stronger than when angular, and the hay and corn work round them much more freely. The bar running under the teeth, and by which they are raised, is so arranged that the teeth do not, as in other rakes, rest upon it, but are allowed to drop into any hollow parts of the land. The frame is made entirely of wrought iron. The teeth work independently of each other, and thus adapt themselves to the irregularity of the surface. It is mounted on high wheels, which are capped to prevent the hay, &c., working round the axles. Price £7 10s.

Crosskill's portable farm railway deserves a special notice. The rails are made of the best red deal, edged with angle iron where the wheels run, and are framed together in 15ft. lengths, which have sockets and catches at the ends so that they fit into each other. Two men can lift the lengths and lay the railway down. It is constructed to carry 15 cwt. loads and has been extensively employed to convey manure, marl, lime, &c., over wet land, to remove turnips, potatoes and other produce, and for earth work in making excavations, embankments, &c. In wet weather when the land is so heavy as to be impassable for carts, the assistance of the portable railway has been found invaluable. The gauge of the rails is 2ft. 6in., and light waggons made to tip either endway or sideway, run upon it. For deviations or corners either turntables or points are used according to circumstances, and parties using the railway are recommended to have two sets of points, so as to form a short double line where required. Each length consists of two longitudinal sleepers, connected together by transverse sleepers in such a manner that they can be folded together (as a parallel ruler) for transport or shipment. The price is 5s. per yard; and extras for turn-tables, switches, &c. We recommend this invention to the consideration of landowners and tenant-farmers of heavy clay land, where so much wear-and-tear is occasioned by bad field roads; and also suggest its applicability to the conveyance of a portable steam-engine about a field.

Crosskill's liquid-manure cart (commended) has an ingenious contrivance for distributing the liquid. A trough receives the water escaping from a brass valve, and has a sluice-door or gate, extending the whole length of the trough, for regulating the rate of emission: this door is slided up and down against a number of triangular apertures, which give a means of the most accurate regulation of quantity flowing through.

Smith and Ashby's one-horse cart for general purposes was commended. This is an exceedingly strong, light, and useful cart, adapted for agricultural or general purposes, and particularly suitable for emigrants. It is made of sound, well-seasoned materials, and combines good workmanship with cheapness. The sides and tail-board are plated on the edge with half-round iron, which both strengthens them and prevents their being worn away by the action of the tools used in loading the cart. These carts are so mounted as to carry their load low and compact, thereby diminishing the labour of loading, and obviating the danger of an upset, the centre of gravity of the load also being lowered; and the great inequality of pressure on the horse which is experienced in high carts, when going up or down hill, is removed. The shafts are so attached, and the raves so constructed, as to prevent the sliding backwards of a top-load when going up a steep hill. Price £11 10s.; with patent tip, 10s. extra.

Crosskill's one horse cart was also commended. Upwards of 3,500 have been sold since the year 1846. It is strong, plain, simple, and very useful for ordinary farm-work. Price £14 5s.

A barrel-churn, invented and exhibited by R. Tinkler, of Penrith, was commended. It is provided with three breakers, the first and second being for the purpose of breaking the cream, and the third for gathering the butter. It is free from all metal, and can be very readily cleaned. From 6 up to 80lb. of butter may be churned by it; and its price is £4.

Mrs. Ann Gilkerson, of Carlisle, exhibits a new barrel-churn, fitted up without iron inside, and running upon three friction-rollers at each end, which considerably facilitates its easy working. Its price is £3 10s.

B. Greening and Co., of 1 and 3, Church-gates, Manchester, exhibit a novelty in the shape of a combined washing and wringing machine and churn, invented by Mr. Massey, of Longsight. It effects by machinery the action given to the "peggy" by the laundress—viz., a perpendicular as well as a circular motion—which is done by a very ingenious arrangement of cranks, chains, and chain-pulleys. The wringing is accomplished by rollers; and when desired, the machine is easily converted into a churn by substituting a churn and churn-staff for the wash-tub and "peggy." The price is £10 10s. Nothing could more forcibly point out the necessity of substituting the use of machinery for the more laborious manual operations of the farm-house and laundry, than the variety and number of patent churns, washing machines, and mangles which have from time to time been brought before the public. It is singular, however, that in none of the machines hitherto made public has the importance been recognized of adopting those principles of action which the experience of ages has established as the most effectual; neither has any effort been made to combine in one implement the most important operations of the homestead. It is, therefore, with considerable pleasure that we call attention to this machine, which not only combines within itself the various actions of churning, washing, and mangling, but includes a number of improvements materially adding to the convenience, efficiency, cleanliness, and ease of each operation.

Nicholson's washing machine is a much more simple affair, price £6. A wringing or squeezing machine can be attached, or had separately, price £3 10s.

William Coulson, of 36, Fetter-lane, York, exhibits a machine for boring and mortising naves, felloes, gates, posts, etc. It sets out the nave for any number of mortises required with accuracy, and it is adapted for mortising a bevel as well as straight. It is furnished with eight chisels from ¼ to 1 inch, and eight worm bitts from 5-16ths to 1½ inch of superior make. Any other size can be had if required. This new machine is remarkable for strength, durability, and correctness. Its price is £27.

James Blair, of Solway House, Carlisle, offers a novelty which is well worth noticing. It is a potato sorter, consisting of riddles resembling those of a winnowing machine. The idea is very good; and the machine—which is very cheap, only £3 10s.—will be of great use in the potato-growing districts. Hitherto no mechanical potato-riddle has performed efficiently.

Johnson, of Leicester, and Sharman, of Melton Mowbray, have brought out some good articles in the shape of hand hay and corn rakes, made of tubular iron, giving great increase of strength with lightness; and their iron scuttles, buckets, &c., may be considered a great improvement upon such articles of wicker or wood, being strong and very durable. We particularly noticed on this stand an iron sack-truck, very light and strong, and only 12 shillings in price.

The brick machine exhibited by Porter and Co., on the principle of the Ainslie machine, with pug-mill combined, is powerful, and worked well at its trial. With a six-horse engine it is calculated to make 30 bricks per minute, or 18,000 per day.

Carson's cheese press is worthy of note, as obtaining sufficient pressure for the largest cheeses without any wheel-work, having only a screw and compound lever, acted on by a 14lb. weight. The price of the single press is £2 10s.

Harkes's press is very simple, having a compound lever action; much less liable to derangement and wear

than wheel-work is. One pound on the end of the lever puts 1 cwt. pressure upon the cheese; so that it will press two 90lb. cheeses at once. Owing to the guide rods attached, it cannot press crooked.

The portable wire fencing of Greening and Co. is worth the attention of farmers, as a substitute for hurdles and netting in the sheep-fold. It consists of strong horizontal wire stands, covered with upright wires at regular distances of 5 inches. It is 3 feet 9 inches high, and only 1s. per running yard. Another variety, 30 inches high, and made with hare and rabbit-proof meshes, is 1s. 3d., or if galvanized 1s. 9d., per lineal yard.

On the stand of Hernulewicz, Maine, and Co., we observed a most admirable contrivance for making a gate self-fastening, in which there was no inclined plane, or, indeed, anything that could possibly wear. This iron gate was highly commended. The iron and wire hurdles and fencing struck us as being remarkably strong and cheap. A corn-rick stand, too—made in two segments, so that it can be enlarged if required—deserves notice; and, as it is intended for having wooden beams laid across, it will bear a much greater weight than stands made entirely of iron. We were pleased with an iron and wire hay-rack, adapted for feeding sheep in exposed pastures. Its legs are set in the ground, so that it cannot tip over; and a cover protects the hay from wet. The price, 6 feet long, is 25s.

E. Archer, of 13, St. Peter-street, Islington, London, exhibits a very ingenious little piece of mechanism for paring apples, turnips, and potatoes. By sticking the apple on a fork fixed to the instrument, and turning this fork round by a small handle, the apple becomes pared by a self-adjusting knife; the time occupied being hardly a moment. Price 15s.

Weir's draining level and improved pendulum workman's level are both very cheap useful for drainers.

J. Knight and Co., of Widnes, near Warrington, exhibited samples of their "nitrogenised bone manures." We believe they were the only exhibiters of manures.

We close our remarks with a parting review of Messrs. Gibbs and Co.'s stand, the seedsmen of the Royal Agricultural Society, where were displayed a great number of remarkable specimens of grains and roots, 500 bowls and 100 bags of different grass seeds, grains—and, in fact, agricultural and garden seeds of every sort; we believe the specimens of wheat alone amounted to 200. The variety formed quite an instructive study to the throng of spectators that continually flocked round the stand; and general admiration was expressed at the beauty and purity of the samples they exhibited. We saw some splendid samples of various meadow grasses, of remarkably fine quality and colour for the season; and it struck us as truly wonderful that some of the *Poas* and other light varieties could be so perfectly and accurately cleaned; yet these samples are taken from the bulk just as they are supplied to the public.

BARON RICASOLI'S SPEECH AT CARLISLE.

Since the meeting we have been favoured with the following translation from Mr. Wren Hoskyns:

It grieves me much that I cannot make use of your language, gentlemen, in order to express in a manner that all might understand the sentiments of my heart and the thoughts of my mind. I am not sufficiently accustomed to your language to be able to make use of it in an extempore speech suitable to this joyful and honourable occasion. There are circumstances in which a man feels strongly the necessity of making all who hear him fully understand all that he feels and all that he thinks. The present is such an occasion for me, in which I would wish to tell you the deep impressions which my sojourn amongst you, although brief, has conveyed to my mind. Your language, therefore, being of no avail to me, I will speak in my own tongue, whose well-known beauty and richness are fully adequate to paint the heart's best feelings and the mind's best thoughts. The English are travellers, and many languages are familiar to them. Often have I heard Italian pronounced by English lips, and not seldom, I must say, has that language received a new grace from the purity with which it was spoken. I am confident, therefore, that in this numerous assembly there are many who will understand my words, and that they again will be my kind interpreters to the rest. It has fallen to my lot to-day to enjoy the high honour of representing in the assembly here convened the Italian nation; and from being myself a native of one of its most cultivated and fertile provinces, well known to Englishmen, my case is rendered the more apposite, and the office confided to me more agreeable. I return my thanks to the illustrious president whose kindness has procured for me a seat in the midst of you; I beg also to thank the stewards, members of council, the secretary, and others, who, on becoming acquainted with my wishes and the object of my journey, have taken every pains to enable me to see and thoroughly examine all the machines and the stock which has been collected for trial in Carlisle. I also heartily thank all those who, from the moment when I first set foot on English land, have with generous hospitality, at once noble and wise, opened to me the way to this great meeting, and have also enabled me to learn what treasures of political, civil, and domestic life are gathered together in this noble country; so that having arrived in London on a short visit to some valued friends, when I think that five weeks have passed and that my departure is near, I derive consolation from the hope that I have gathered much instruction, and drawn many useful lessons from my short sojourn in your country. If it be true, that in order to know and appreciate a nation, a lengthened sojourn in it is not so necessary as to see its internal organization, it is more true with respect to England than any other nation, because the primal law of her being lies in her customs and habits, to which her institutions and laws are accommodated with the most harmonious wisdom. The first condition of happiness lies in this. It is but a foolish pretension and a great misfortune, if a nation endeavours by institutions and laws to give itself new custom, or to change them before the already changed custom imperiously demands it; since custom is a composite result of the sentiments, the thoughts, and the habits which surround and penetrate life, constituting the national character, which never changes, and only in some places, and very slowly, even modifies itself. For this reason, I believe there is no state more solidly constituted than the English nation; and none more adapted for development, moral, civil, and political—those three phases of human life which must be jointly fulfilled, in order that the ends of all true policy may be carried out. It is simply because I think thus, that I utter these words; I could

not stoop to flatter a people I so much esteem and honour. Now it appears to me that one of the most prominent of your national customs is, the way in which you treat agriculture. This is a great fact, of which we will rapidly run through the most leading points. Here, agriculture is not only a science and an art, but the practice of life—a means not only for developing material wealth, but also, and still more, for developing the moral condition. Honoured by all, it renders honourable all who make it their profession and their delight. Happy, in truth, do I hold that country to be, where such a state of things comes to pass, because it reveals great qualities in the people who inhabit it. I do not look to the money which is spent in improving farms; but I do look to the eminent quality which the practice of agriculture demands—morality, perseverance, and true intelligence. When I see agriculture favoured alike by the small farmer and the noble lord; when I see earls, marquises, and dukes assembled here, to consider attentively the affairs of agriculture, distinguishing themselves by letting their own names figure on the best machines; when I think of the life which is spent in the lordly castles of England a great part of the year, in improving the land and educating the people by precept, by example, as well as by munificence, a spontaneous feeling and thought induce me to exclaim, "Happy, happy is that country where the best example comes from the highest classes—where it is the custom to honour and to cherish agriculture, and to make it the source of pious and gentle pleasures, and the means of social and moral training!" That husbandry is here pursued as an art and a means of pleasurable wealth with success as well as perseverance and energy, let this great meeting witness: it is witnessed by the variety and quality of the animals; it is witnessed by the collection of agricultural machines, which from the simple scythe or rake rises to the thrashing and reaping machine, so that no part of farm-work is left uncared for, but each may find the instrument best adapted to fulfil its purposes in the best manner and at the least expense. If time and language sufficed me, I could tell how agriculture thus practised leads a nation to the most perfect results; but it is sufficient now to recal to the minds of my hearers that the greatest example of modern civilization has been given to the world by the English nation, when it broke through the ancient walls of prejudice and jealousy, and gathered together in its bosom, in the year 1851, all the nations of the world, proclaiming with a voice at once Christian and politic that hatreds, and jealousies, and rivalries were at an end; and that justice being the base of all international relations, all were equally interested in emulation for the highest ends. This fact, I will not disguise, is the sign of a new epoch in the history of humanity; from that day the political world received new conditions, which the future will yet unfold. These praises of English agriculture may well come from one who was born on the soil of Tuscany. My country and yours, gentlemen, I may add, in the words of your illustrious president, are united in one common bond of sympathy; in an alliance which nothing will dissever, and which I trust the circumstances of the future will render still more solid and close. Allow me, gentlemen, to close my speech by proposing the toast which is the expression of my warmest feelings: "Health and prosperity to you who honour agriculture as the source of virtue and of wealth, and who pursue it with so much ardour and intelligence; health and prosperity to the noble English nation, who first rose in the field against the errors of political egotism and immorality, and set the world an example of liberal and Christian policy."

PAUCITY OF SCOTCH STOCK AT THE CARLISLE MEETING.

Sir,—In your remarks on the meeting of the Royal Agricultural Society held at Carlisle, you say that it may be considered a joint exhibition of the two national associations; that in some respects it has been so; that if it has not been so to the full extent no blame rests with the management of that body under whose auspices the gathering took place. You further state that there was ample opportunity given to Scotch breeders if they only chose to avail themselves of it; and then say—"We cannot help thinking that our Scotch friends have sadly missed their opportunity; and that it would have been to their advantage to have shown us even something more than Clydesdale horses, Galloway cattle, or mountain sheep."

As a Scotch farmer, I trust you will allow me a little space to explain why I did not exhibit at Carlisle, as I feel satisfied the same causes operated in the same way with others. One of the rules of the Highland Society of Scotland is, that the ages of all stock exhibited shall be computed from 1st January. This rule has existed for many years, long before the Royal Agricultural Society of England was in existence. We have therefore been in the habit of breeding our stock so as to meet that rule, especially with the cattle intended for exhibition; most of our best cattle therefore are calved between 1st January and 1st May. On the other hand, one of the rules of the English society is, that ages shall be computed from 1st June: we therefore could not exhibit our stock against that of England excepting at great disadvantage, English breeders having been breeding their stock for years back so as to meet this rule. Take one-year-old bulls as an example. The rule of the English society is that they shall be more than six months old at the day of exhibition, and less than twelve, the age to be computed from 1st June. Now, all my cattle were calved between 1st January and 1st May; consequently I had none of this year's stock above six months old, and none of last year's below twelve. I was therefore entirely precluded from exhibiting in this class; while in every other age I was similarly situated, and, if I showed at all, must have done so at a year's disadvantage in age. Had the Carlisle show been considered a joint exhibition of the two national associations, it would only have been fair to have allowed us to enter the lists on equal terms, which could easily have been done by calculating the ages of animals to be exhibited from their day of birth, thereby allowing year-olds to compete against year-olds, and two-year-olds against two-year-olds, and so on.

Another reason why I did not exhibit at the Carlisle show was that I, in common with many of my brother farmers, thought if your Society wished us to compete, that they would have given us an opportunity of doing so by advertising the list of premiums to be awarded, showing the classes to be exhibited, and the rules for competition. Instead of doing this, however, we were kept in total ignorance, and it was only after having been requested to obtain the information, if possible, that the *Dumfries Courier* published in the month of April the following:—"In a recent publication we made some remarks upon the want of information afforded to the farmers on this side of the border with reference to the show of the

English Agricultural Society at Carlisle;" and then go on to state that they have now obtained the prize lists; but they do not, even then, give the rules.

Now, after this, I will ask you if you consider that Scotch breeders would have competed at Carlisle on equal terms with English breeders, who, having long known the rules of the Society, were prepared with stock to meet them? Recollect, however, I make no complaint. The English Society have a right to make what rules they please, and they have an equal right to withhold or to give information to the breeders in Scotland; they withheld the information, and did not advertise their list of premiums on this side of the border; but we made no complaint, although all the agricultural societies in this county having contributed to the funds of the Carlisle meeting, we thought we might have been favoured with direct information, by having the list of premiums, &c., advertised in some of our local papers, and I only write this now to protest against the meeting at Carlisle being considered as a joint meeting of the two countries, or that the small extent of Scotch stock exhibited is to be held as showing any want of spirit among our breeders, as I consider myself justified in saying that at Carlisle we have had no fair chance of exhibition, and that we would have been fools had we entered the lists on the unequal terms offered us.

Rest assured, whenever England and Scotland meet on fair terms, that you will find no want of spirit on this side of the border. Witness the numbers who attended the show at Carlisle, although few had any direct interest in the matter; the immense attendance from Scotland showed no apathy or want of spirit. All we ask is a fair field and equal competition; without that, I am sure, neither you nor any right-thinking man would advise us to enter the lists.

I am, Sir, your obedient servant,

A Dumfriesshire Farmer.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Monthly Council was held, at the Society's House in Hanover-square, on Wednesday, the 1st of August, present: Colonel Challoner, Trustee, in the chair, Mr. Raymond Barker, Mr. Barthropp, Mr. Evelyn Denison, M.P., Mr. Fisher Hobbs, Mr. Mainwaring Paine, Mr. Allen Ransome, Professor Simonds, and Mr. Townelev.

Henry Akroyd, Esq., of Doddington Hall, Cheshire, was elected a Governor of the Society.

The Right Honourable The Lord Mayor of London was elected a Member of the Society.

The following new Members were also elected:

Ball, Captain Thomas, Robertswalls, Malahide, Co. Dublin
Burness, William, 2, Prospect Terrace, Brixton
Burnett, Thomas, Hutton, Preston, Lanc.
Cartwright, Thomas Robert Brook, Aynhoe, Northamptonsh.
Causton, Joseph, Champion Hill, Camberwell
Cust, Leopold, Leasowe Castle, Birkenhead
Dashwood, Frederick Loftus, Kirtlington Park, Oxon
Dewhurst, George, Brown-street, Manchester
Dillon, Viscount, Dytchley Park, Oxfordshire
Kennedy, James, Tamhorn Park, Lichfield
Harrison, William H., Clipston House, Northamptonshire
Herbert, William, St. Giles Street, Oxford
Mucklestone, Jonathan, 67, Regency Square, Brighton
Nichols, B., Farnham, Surrey
Nichols, George, Great Dalby, Leicestershire
Patterson, Richard, Crofton Hall, Cumberland
Saltmarshe, Philip, Saltmarshe, Howden, Yorkshire
Sebright, Sir Thomas, Bt., Beechwood, Market Street, Herts
Stamford, Walter, Parham, Storrington, Sussex
Stratton, George, Spinnymore House, Durham
Thompson, Major A. G., Bridekirk, Cockermouth
Usedom, The Baron von, Berlin, Prussia

Finances.—Mr. Raymond Barker, chairman of the Finance Committee, laid before the Council the monthly report on the accounts of the Society, from which it appeared that the current cash-balance in the London bankers' hands was 2,697*l*.

Mr. Pusey.—Lord Portman communicated to the Council his intention of moving, at the Monthly Council in December, the consideration of the best means by which the Society may express and record its deep sense of the value of the late Mr. Pusey's services, in promoting its objects, and the general advancement of English agriculture.

Implement Trials.—Mr. Fisher Hobbs, Senior Steward of the Implement Department at Carlisle, reported most favourably of the recent exhibition and trial of implements. He thought it also a strong fact that he had on that occasion no protest to present to the Council against any of the awards made at Carlisle. He had several suggestions to offer on his own part, as well as on the part of the exhibitors, in reference to the exhibition and trial next year at Chelmsford. These he intended to lay before the Council in November, when they would no doubt be referred as usual to the consideration of the Implement Committee of the Society.

Foreign Stock and Implements.—Mr. Fisher Hobbs took that opportunity of stating that when the Council again assembled after the autumn vacation, he should move the following resolution:—"That special prizes be offered at the Chelmsford Meeting for the live stock and agricultural implements of foreign countries."

Veterinary Inspection.—Professor Simonds reported to the Council the result of his professional inspection of the animals exhibited in the Society's show-yard at Carlisle. Among these animals, especially in the classes of pigs, several animals were satisfactorily ascertained to be considerably above the ages at which they had been entered for competition; and so gross and palpable were some of these cases, that the Council referred the whole details to the stewards of the yard, with a request for their general report on the subject in November next, in order that the Council might determine in what manner these erroneous certificates ought to be dealt with.

Chelmsford Meeting.—A General Chelmsford Committee, for the country business of next year, was appointed.

Adjournment.—The Council then adjourned over the autumn vacation, to Wednesday, November 7.

THE YORKSHIRE AGRICULTURAL SOCIETY.

MEETING AT MALTON, AUGUST 1.

On the last two occasions the show-yard of the Yorkshire Society has been well "fed" by those meetings of the national body which immediately preceded the celebration of the local one. Both Lincoln and Carlisle were within convenient reach of Ripon and Malton, and both sent on some of their most successful entries, to have their excellence still further confirmed by so good a test as that the county of York might be supposed to afford. This has been especially the case at Malton, with that variety of stock which now holds the first place in nearly all our prize lists, and that the range of this association is as peculiarly famous for. The show of short-horns at Malton was even more than usually strong, while its chief attractions were those which had been similarly distinguished at Carlisle. Mr. R. Booth's white bull Windsor, which took the first prize at the meeting of the Royal Society, took the first at Malton, and Lord Feversham's Gloucester has been second to him on both of these adjudications. The first prize cow, again, at either was Mr. Booth's Bridesmaid—Mr. Douglas's The Rose of Summer, which stood second to her at Carlisle, here taking the prize in another class. A commended cow however, from Carlisle, Mr. J. Booth's Venus Victrix, had now the second premium in the first class of cows. The yearling bull also came on from the meeting of the previous week, and indeed, without taxing the memory too far, or staying to prove one catalogue by the other, nearly all the picked exhibitors at Malton had, with justice, deemed their stock good enough to show anywhere and in any company. Mr. Towneley brought some of his beautiful young animals, whose development at such an age was certainly never excelled. Mr. Ambler's herd was again well represented, and Lord Feversham and Mr. Douglas backed Gloucester and "the Rose" with other entries that well deserved the commendations they received. To enter very minutely into the Short-horn classes at Malton would be only to go over again what has already, or is still being considered in reference to the exhibition at Carlisle. The one, in all its best features, was but an echo of the other. If the Royal Agricultural Society's was a good show of Shorthorns, so assuredly was that at Malton; for what tended to the excellence of the one, did almost equally so to that of the other.

It is in two particular branches of all that it extends to that the shows of the Yorkshire Society are generally famous—in cattle and horses. In both has it been more than usually so at Malton. Whereas in cattle, however, there is hardly anything entered but one particular sort, the Shorthorn—the horses, on the other hand, contain every variety of breed it is possible to wish for. From the racehorse to get hunters, to the hunter himself, coaching stallions and coach-horses, roadsters and cart-horses, with mares and foals of every kind and of every age. The Yorkshire show of horses, in fact, is something more than a mere show. You meet Mr. Collins from London, with many other dealers from neighbouring districts, all on the look-out for something to bid for, and singularly indifferent as to what the judges may select for the white colours, or which for the green. We heard of one horse in the large entry of four years old hunters being sold two or three times over, beginning at two hundred, before the judges even came to him. He was a bay, white-legged horse, by Cowl, and a magnificent specimen of the weight-carrying hunter, with all that fashion and style that good blood alone could give him. When the judges did see him, however, there was no mistake about it, and he with justice stands first in the prize sheet. Nearly all the class, still, consisting of five-and-twenty entries, were good, the second prize horse, by Robinson, being as indisputably worthy of the place he had awarded him. Yorkshiremen are not only horsemen, but sportsmen, and these hunting geldings had continued throngs of admirers, headed by the all popular "Sir Tatton," who came, again and again, to look them over.

There was, too, a more than average entry of thorough-bred horses. If there should be any one yet unconvinced as to the policy of breeding hunters from race-horses, he should have been at Malton on Wednesday. There were some of considerable renown in *the Calendar*: Galaor, Fugleman, St. Lawrence, Burgundy, and Pigskin amongst them. Of these Galaor was nearly covered with medals, commemorating the success he had achieved at different agricultural shows in the North of England. He here, though, succumbed to a certainly better-looking animal. It is rarely one sees a more powerful specimen of the thorough-bred horse

than Burgundy has now grown into. He was, moreover, in very high form, as fresh and as full of play as a kitten, and when the judges tied the white ribands to his head, they had the popular feeling entirely with them. The commended horse Pigskin is a very neat nag, and a great favourite in this country from the gameness he has evinced in sundry steeple-chases and other hard fights for it over a country and a course.

The class of coaching stallions, good both in entry and merit, included many horses of much the same character—that of the Cleveland, which when well matched and broke, fetch such high prices. For especial character and "mark," however, the roadsters figure still more prominently at this Society's meetings. No where else do we see such a lot of good hacks—many of them small in size and great in strength, but still not the heavy-shouldered and heavy-looking cob, but a light, active, merry-going one, that Dick Turpin or Sir Tatton Sykes himself might pick out in a moment for one of his rides from London to York. There were many such as these to be seen at Malton last week, although the first-prize horse was hardly as much of the sort as some others opposed to him The commended one, Merrylegs, is a better illustration of what we mean; while the most perfect specimen of all is the one-eyed Prickwillow, who having already carried off the premium of the Society could only here be shown in the extra stock, where he was, of course, again successful.

The awards to the stallions for agricultural purposes were not made until late on the Thursday. Both the first prize and the grey which took the second, were very active, useful animals; indeed, there was but little "lumber" in any of the class, which, in point of general merit, stood well with those we have already referred to. A very good specimen of the Clydesdale called Champion, should, we thought, have been worthy some commendation, but we see he was not noticed by the judges.

With the exception of some of those in the heavy draught classes, few of the brood mares were so good as those shown at Ripon last year. In addition, though, to the four-year-old hunters, there were several sections of good young stock for riding and driving, but so scattered about the show field that it was rather difficult to follow them out. Whether, from the ground being against them, or from some other cause we are not acquainted with, the management had not been so happy as we have known them in their arrangements. We have often since cited the succession of paddocks, and general placing of the horses at York, two years ago, as the best thing of the kind we ever saw. It has not been so good since.

There was a short sheep show; and, as was said, for an average, although we hardly perceived it, a yet smaller entry of pigs. These, with an excellent exhibition of poultry, in which the general condition of the birds far excelled those at Carlisle last week, comprised the live stock catalogue. In the sheep the only competition was in the two classes for the Leicester or long-woolled rams, the quality of which, beyond Messrs. Barton and Simpson's, was nothing remarkable. We certainly expected in such a district a much larger and better entry. In Southdowns there were three lots in two classes, John Scott, the trainer, being the only exhibitor against Lord Walsingham. In the classes for Scotch sheep there were also three entries for two classes. These were three rams, each secured with double reins from their head-stalls, and looking very vicious, but being in fact only very wild, and ready to jump over anything in their line.

In the pigs, as at Carlisle, the preference was again all with the smaller breeds, in which the approvals were very liberal, one lot of the sows being generally and deservedly commended. There is one half measure, however, in the Yorkshire Society's proceedings which we should like to see a little further carried out. As it is, there is at these summer meetings a prize for the best fat ox, and another for the best fat cow. Would it not be better to perfect this, and give also a prize for the best fat pig? We might then be able draw a distinction between what is a breeding pig and what is a fat pig, which at present we confess we are scarcely equal to. Indeed, so far, even with the cattle, it is rather a nice point. We will undertake to select one of the prize breeding cows, as so shown at this last meeting, and place her by the side of the prize fat cow, and then—which is Napoleon and which is Wellington—which is the fat cow and which is the breeding one? The answer to either of these interesting inquiries must be precisely the same—the show people cannot be bothered about it—"Whichever you please, you've paid your money and you take your choice."

The implement prize list will speak in a great measure for itself. It was altogether one of the best shows of the kind the Society has yet had. There was nothing, however, very novel, beyond Boydell's traction engine, which is rapidly sinking its qualifications for the plough, into the more really useful purposes to which the wheel-principle can be adapted, and for which it was commended both here and at Carlisle. It was extensively advertised to *draw* not only heavy weights, but large groups of spectators, under the title of "the steam horse; whereas "the steam elephant," with the driver on the front, gives a far better notion of its appearance. There were many of the implements

not tried, the weather on the Tuesday being altogether against it. For the ploughs, though, none was contemplated, the premium being for the best assortment—neither the Ransomes nor the Howards in it. In the prizes for steam engines there were only two entries, the conditions specifying not only for a thrashing but for a dressing and finishing machine. Neither the Hornsbys nor the Tuxfords, we believe, manufacture these unless to order, and Clayton and Shuttleworth had consequently an easy victory. Messrs. Holmes, of Norwich, were their only opponents, while the two other firms we have mentioned had their engines at work in the yard, although, for the reasons given, neither was put into competition. There was only one reaper, a new invention, which was not tried; while next to "the steam horse," perhaps, "the horse treadmill" attracted most attention. It is really a "horse-power" invention, susceptible of all kinds of uses, in which a horse stands in a box, and works on without ever advancing, very much in the treadmill style. It appeared to be hard work, and has anything but a grateful look. Instead of horses, we should recommend it as a second ordeal for some of our criminal population, and turn a few "ticket-of-leave" men into it for a week or two, previous to letting them quite at large again.

The first day's proceedings closed with what is called the "Council Dinner," and subsequent discussion. Why it is called, par excellence, the "Council's" dinner we will not undertake to say, as any one may go to it who likes to pay half a guinea for a ticket—a privilege of which by no means too many avail themselves. Indeed, after our own experience, we don't wonder at it. The ticket is too high, and the dinner is too bad. It is just one of those clumsy attempts at being "fine" which Theodore Hook would have delighted to describe, and Walker, of "The Original," have shuddered to sit down to. Tepid fish, tough, greasy, cold venison, a heated, clouded atmosphere and miserable attendance—four or five waiters to three or four people—and everybody else to help himself, if he has the heart or appetite to do so. We do not know who has the sub-management of this—from what we witnessed, we should think no one at all; but when we see such men as Mr. Thompson and Sir John Johnstone in the room, we would seriously ask if it cannot be better done? With the experience they have had of the success of the cold dinner of the Royal Agricultural Society, surely they might adopt it here. People do not attend these anniversaries with the idea of faring sumptuously — a slice of cold beef, or the wing of a fowl, with a glass of decent sherry, and a well-ventilated room—these, with a little method in directing the attendance, is all that need be aimed at. The price of the ticket might then, for a local meeting, be fairly reduced at least a third of what it now is, and a good instead of only a moderate muster, as on Wednesday, would be the result. This has already been successfully tried with the West of England Society; and we hope never again to have to undergo the tedious miseries and sickening luxuries of a Yorkshire Council dinner. From what we could observe there were but comparatively few farmers in the room—country gentlemen with many of their agents, and others rather connected with the town than the country. This was the more to be regretted as the discussion, which we give in another column, was a very interesting one, and just such as a working farmer could take a part in. It was well opened by Mr. Thompson, and still better followed up by Captain Legard, who good humouredly, but with much ability, threw out plenty of material for the more practical men to grapple with. His brother, however, was the only bonâ fide farmer who answered him. The "Council" dinner is a sad mistake—let it drop into the Society's, and let us have a cheap good one, instead of what is now just the reverse.

As far as the town of Malton was concerned, the week was one great holiday. There were triumphal arches and evergreen welcomes; a bazaar in one part of the town, a flower-show in the other; "an "All-England" match at cricket to take some of the visitors to the Wolds, and a peep into John Scott's stables for others wickedly inclined enough to put the thorough-bred horse to even something more than "hunting purposes."

PRIZES FOR CATTLE, &c.

JUDGES.—Mr. R. Dand, Field House, Alnwick.
Mr. W. Cattle, Dromont Grange, Lockerby.
Mr. T. Crofton, Holywell, Durham.

SHORTHORNS.

For the best bull of any age, first prize of £25, to Mr. R. Booth, Warlaby, Northallerton; second of £10, to Lord Feversham, Duncombe Park, Helmsley. *Highly commended*, Mr. C. Towneley's bull. *Commended*, Mr. H. Tempest's bull.

For the best yearling bull, first prize of £20, to Mr. F. H. Fawkes, Farnley Hall, Otley; second of £5, to Mr. A. L. Maynard, Marton-le-Moor, Ripon. *Commended*, Mr. J. Darley's bull.

For the best bull calf, upwards of 5 months old, first prize of £10, to Mr. C. Towneley, Towneley Park, Burnley; second of £3, to Mr. F. H. Fawkes. *Highly commended*, Mr. H. Ambler's bull. *Commended*, Lord Feversham's bull.

For the best cow of any age, in calf or milk, first prize of £15, to Mr. R. Booth; second of £5, to Mr. J. Booth, Killerby, Catterick. *Highly commended*, Mr. H. Ambler's cow. *Commended*, Lord Feversham's, Mr. F. Jordan's, and Mr. J. Yorke's cows.

For the best three-year-old cow, in-calf or milk, and having had a calf, first prize of £10, to Mr. J. Douglas, Athelstane Ford, N. B.; second of £5, to Lord Feversham.

For the best two-year-old heifer, in-calf, first prize of £10,

to Mr. C. Towneley; second of £5, to Mr. R. Booth. *Commended,* Mr. L. Thompson's heifer.

For the best yearling heifer, first prize of £10, to Mr. J. Hall, Kiveton Park, Worksop; second of £5, to Mr. J. Douglas, Athelstane Ford. *Commended,* Mr. F. Jordan's, Mr. F. Ferguson's, Mr. C. Townley's, and Mr. J. Douglas's heifers.

For the best heifer calf, upwards of 5 months old, first prize of £7, to Mr. C. Towneley; second of £3, to Mr. R. Booth. *Commended,* Mr. C. Towneley's and Mr. J. Emmerson's heifers.

For the best fat ox, of any age, the prize of £5, to Mr. H. Vyner, Newby Hall, Ripon. *Highly commended,* Mr. G. Taylor's ox. *Commended,* Mr. S. Wiley's two oxen.

For the best fat cow, of any age, the prize of £5, to Mr. H. Ambler, Watkinson Hall, Halifax.

CATTLE OF ANY BREED.

For the best cow for dairy purposes, the prize of £7, to Mr. Q. Clark, Bilton, York.

EXTRA STOCK.

The prize to Mr. L. Thompson, Sheriff-Hutton Park, York, for a white heifer.

SHEEP.

JUDGES.—Mr. W. Heseltine, Worlaby, Brigg.
Mr. H. Chamberlain, Desford, Leicester.
Mr. W. Bartholomew, Langton, Wragby.

LEICESTER, OR LONG-WOOLLED.

For the best and second-best shearling ram, the prizes of £15 and £5 to Mr. J. Borton, Barton-le street, Malton.

For the best ram of any age, first prize of £10 to Mr. J. Borton; second of £5 to Mr. J. Simpson, Spofforth Park, Wetherby. *Highly commended,* Mr. W. Simpson's ram. *Commended,* Mr. J. Borton's, Mr. C. Clark's, Mr. T. Hannam's, and Mr. T. Stamper's rams.

For the best pen of five ewes, first prize of £5 to Mr. W. Taylor, Thornthorpe, Malton; second of £3 to Mr. J. Holiday, Barmston, Lowthorp. *Commended,* Mr. J. Simpson's ewes.

For the best pen of five shearling wethers, the prize of £5 to Mr. T. Dawson, Poundsworth, Driffield. No competition.

For the best pen of five shearling gimmers, first prize of £10 to Mr. W. Abraham, Barnetby-le-Wold, Ulceby; second of £5 to Mr. T. Beale Browne, Hampen, Andoversford.

SOUTHDOWN.

For the best ram of any age, the prize of £5 to Lord Walsingham, Merton Hall, Thetford. No competition.

For the best pen of five shearling gimmers, the prize of £5 to Lord Walsingham.

BLACKFACED SCOTCH, OR HIGHLAND.

For the best ram, first prize of £5 to Mr. J. Estill, Blake House, Pickering; second of £2 to Mr. T. Wilson, Bilsdale.

EXTRA STOCK.

First prize to Mr. S. Wiley, Brandsby, York, for a fat ewe; second to Mr. J. Borton, for an aged ram.

PIGS.

JUDGES.—Mr. W. Heseltine.
Mr. H. Chamberlain.
Mr. W. Bartholomew.

For the best boar, large breed, first prize of £5 to Mr. T. Horsfall, Burley Hall, Otley; second of £2 to Mr. W. Prince, Yedmandale, West Ayton.

For the best sow, large breed, in pig or milk, first prize of £5 to Mr. J. Harrison, jun., Heaton Norris, Stockport; second of £2 to Mr. T. Horsfall.

For the best boar, small breed, first prize of £5 to Lord Wenlock, Escrick Park, York; second of £2 to Mr. G. Mangles, Givendale, Ripon. *Commended,* Mr. M. Barroby's (two) and Mr. T. Mangles' (two) boars.

For the best sow, small breed, in pig or milk, first prize of £5 to Mr. T. Horsfall; second of £2 to Mr. G. Mangles. *Commended,* Mr. G. Mangles' (two) and Mr. T. Horsfall's sows. *This class generally commended.*

For the best three store pigs, of the same litter, from four to nine months old, first prize of £5 to Mr. W. B. Wainman, Carnead, Skipton; second of £2 to Mr. M. Barroby, Dishforth, Thirsk. *Highly commended,* Mr. G. Mangles' pigs.

For the best sow of any breed, first prize of £5 to Mr. W. B. Wainman; second of £2 to Mr. G. E. Taylor, Oatlands, Leeds; third to Mr. J. Palmer, Thorlby, Skipton; fourth to Mr. T. Birkbeck, Settle.

For the best boar of any breed, first prize of £5 to Mr. G. Mangles; second of £2 to Mr. G. E. Taylor; third to Mr. T. Craven, Manningham, Bradford.

EXTRA STOCK.

First prize, Earl Fitzwilliam, Wentworth House, Rotherham, for a sow; second, Mr. J. Henderson, Castle Howard, for a sow.

HORSES.

JUDGES:—Mr. Thomas Brook, Croxby, Lincolnshire.
Mr. W. Uppleby, Bonby, Barton.
Mr. W. Earle, Uckerby, Richmond.

For the best stallion for hunters, first prize of £10, to Mr. W. Daykins, Doncaster, for Burgundy, by Ishmael, dam by Drone; second of £3, to Mr. J. Smith, Marton Lodge, Bridlington, for Galaor, by Muley Moloch, dam by Amadis. *Commended,* Mr. F. Midgley's Pigskin.

For the best stallion for coach horses, first prize of £10, to Mr. J. Johnson, Brigham, Driffield, for Benledon; second of £3, to Mr. T. Holliday, Newland Hill, for Napier. *Commended,* Mr. J. Sergison's Emperor.

For the best stallion for roadsters, first prize of £10, to Mr. J. Foxton, Waithwith, Richmond, for Bay President; second of £3, to Mr. R. B. Ridsdale, Water Gate, Ripley, for Troubadour. *Commended,* Mr. J. Lister's Merrylegs.

For the best stallion for agricultural purposes, first prize of £10, to Mr. J. Ramsbottom, Bilham Grange, Doncaster, for Iron Duke; second of £3, to Mr. A. Hill, Normanby, Kirby-moorside, for a grey horse.

For the best mare and foal for hunting purposes, first prize of £5, to Mr. H. Marr, North Holme, Malton; second of £2, to Mr. H. S. Thompson, Kirby Hall, York.

For the best mare and foal for coaching, first prize of £5, to Mr. Q. Clark, Bilton, York; second of £2, to Mr. G. Piercy, Garton, Driffield.

For the best roadster mare and foal, first prize of £5, to Mr. Staveley, Dotterill Park, Kilham; second of £2, to Mr. T. Nicholson, Watton, Driffield.

For the best mare and foal for agricultural purposes, first prize of £5, to Mr. J. Simpson, Hunmanby; second of £2, to Earl Fitzwilliam.

For the best three years old hunting gelding, the prize of £5, to Mr. W. S. Gofton, Wharram Percy, Malton, for bay, by Mercian.

For the best three years old hunting filly, the prize of £5, to Mr. J. Kirk, Moor Monkton, York, for brown, by Roland.

For the best three years old coaching gelding, the prize of £5, to Mr. B. Johnson, Frodingham Bridge, Driffield, for bay, by Nestor. *Commended,* Mr. W. Mann's bay gelding.

For the best three years old hackney gelding or filly, the prize of £5, to Mr. F. Jordan, Eastburn, Driffield, for Prickbelt, by Prickwillow.

For the best three years old gelding or filly for agricultural purposes, the prize of £5, to Mr. T. Chantry, Acaster Selby, York, black, by Ajax. *Commended,* Mr. T. Dawson, Poundsworth, Driffield, for Jolly.

For the best two years old coaching gelding, the prize of £5, to Mr. T. Plummer, Thormanby, Easingwold, for bay, by Politician. *Commended,* Mr. W. Smith's bay.

For the best two years old coaching filly, the prize of £5, to Mr. C. Pybus, Catterick, for Eva, by Arncliffe. *Commended,* Mr. J. Smith's bay filly.

For the best two years old agricultural gelding or filly, the prize of £5, to Mr. R. Simpson, St. Trinians, Richmond.

For the best yearling gelding or filly for agricultural purposes, the prize of £5, to Mr. J. Foster, Southburn, Driffield. *Commended,* Mr. E. Spink's grey.

For the best pair of horses of either sex, for agricultural purposes, worked during the season, the prize of £5, to the Earl of Carlisle, Castle Howard. This class *generally commended.*

For the best hackney gelding or mare, not less than four years old and not exceeding six, the prize of £5, to Mr. R. Jones, New Malton, for chesnut, by Perion. *Commended,* Mr. F. C. Matthews' brown, and Mr. S. Kirby's bay.

For the best four years old hunter, gelding, or filly, a silver cup of the value of £20, to Mr. T. Ellerby, Whitwell, York, for bay gelding by Cowl; second prize, £5, to Mr. R. Stockdale, Skerne, Driffield, for brown gelding by Robinson. *Commended,* Mr. J. B. Barkworth's, and Mr. T. Hopper's.

EXTRA STOCK.

First prize to Mr. W. Weatherill, Murton, York, for Prickwillow, by Performer; second prize to Mr. J. Smith, Marton Lodge, Bridlington, for coaching mare. *Commended,* Mr. D. Layborn's chesnut hunter.

PRIZES FOR IMPLEMENTS.

JUDGES.—Mr. J. Brown, Wrangbrook, Pontefract.
Mr. Peter Stevenson, Rainton, Thirsk.
Mr. George Legard, Easthorpe, Malton.
Mr. W. Lister, Dunsa Bank, Richmond.
Mr. T. Scott, Broom Close, Ripon.
Mr. J. Almack, Beverley.

For the best assortment of ploughs—£10, to Mr. Palmer, of Stockton. *Highly commended*—Mr. Dove, of York; and Mr. Busby, of Newton-le-Willows.

For the best assortment of harrows—£5, to Mr. Busby.

For the best cultivator or grubber—£20, to Mr. Coleman, of Chelmsford.

For the best waggon—£5, to Mr. Busby.

For the best cart—£5, to Messrs. Barker, of Dunnington.

For the best portable thrashing machine, with dressing apparatus, to be driven by steam-power—£20, to Messrs. Clayton and Shuttleworth, Lincoln.

For the best corn drill—£5, to Messrs. Hornsby and Sons, of Grantham.

For the best turnip drill on the flat, capable of distributing hand-tillages as well as seed—£10, to Mr. Kemp, of Alford, Lincolnshire.

For the best turnip drill on the ridge—£5, to Messrs. Hornsby and Sons.

For the best machine for distributing guano, &c., broadcast—£10, to Mr. T. Chambers, of Colkirk, Norfolk.

For the best grinding mill for breaking agricultural produce into meal—£10, to Mr. Hodgson, of Scampston.

For the best broad-share—£2, to Mr. Bentall.

For the best grubber—£2, to Mr. Kirkwood.

For the best clod-crusher or roller (Patterson's)—£2, to Mr. Palmer.

For the best subsoil and trench plough—£2, to Mr. Cotgreave.

For the best hariff rollers and cloth, to be fixed to any dressing machine—£2, to Mr. Sawney.

For the best brick and tile machine—a Silver Medal, to W. Strickland, Esq., of Hildenley.

For the best general collection of agricultural implements—£2 and a Silver Medal, to Mr. Dove.

For the best cooking apparatus for the farm kitchen—£2 and a Silver Medal, to Mr. Calvert, of York.

The judges recommended the council to award a premium of £10 to Mr. Boydell, for his locomotive traction engine and cart wheels; £1 to Mr. Bentall, for his improved harrows; a Silver Medal to Mr. Hartas, of Wrelton, Pickering, for his improved turnip-cutter; £1 to Mr. Woods for his pulping machine, and £1 for his linseed mill; £1 to Mr. Buxton, of Malton, for his grinding mill; £2 to Mr. Newis, for his barley and oatmeal mill; a Silver Medal to Mr. Kearsley, for his straw-cutter; and they *highly commended* Mr. Graham's draining tiles and junctions.

PRIZES FOR WOOL.

JUDGES.—Mr. J. Barff, Wakefield.
Mr. Clayton, Stanley Hall, Ripley.

For the best five fleeces of long wool—£5, to Mr. J. Booth, of Killerby. No competition.

For the best five hog fleeces—£5, to Mr. J. T. Robinson, of Leckby Palace. Second do.—£2, to Mr. Nicholas Grunden, of Croom.

For the best five ewe fleeces of short wool—£5, and second of £2; for the best five hog fleeces—£5, and second of £2, all to Lord Wenlock.

PRIZES FOR FLAX.

For the best specimen of scutched flax—£5, to Mr. Richard Beilby, of Fairfield, York. Second—£2, to Mr. John Boyle.

For the best specimen of green flax—£5, to Mr. H. Tennant, of Skewkirk, Tockwith. Second—£2, to Mr. G. Lowther, of Shipton, York.

There were two other classes in this department, but for crops now growing.

THE DINNER, AND DISCUSSION

ON "THE CAUSES WHICH AFFECT THE PRODUCTIVENESS OF THE WHEAT CROP,"

Took place on Wednesday afternoon, in the Corn Exchange, Lord Wenlock in the chair, and Lord Hotham in the vice-chair. There were also present Sir G. Strickland, M.P., Sir J. V. B. Johnstone, Bart., M.P., Sir Tatton Sykes, Mr. E. S. Cayley, M.P., the Hon. C. W. Fitzwilliam, M.P., Mr. H. S. Thompson, and many other gentlemen of the county.

The usual loyal toasts having been duly honoured, and the health of the Chairman proposed and responded to,

Mr. H. S. THOMPSON, of Kirby Hall, proceeded to open the discussion. In doing so, he observed that before entering upon the immediate subject then before them, he would wish to point out the very large money value and the difference between a really productive wheat crop, and one which might be called a bad crop. The state of the country during the last two years afforded them a very good opportunity of comparing its results. In 1853 the wheat crop was an extremely unproductive one. What was the result of that? Why, in consequence of the large quantity of wheat this country had to purchase, and the high price which had to be paid for it, a drain of bullion in the bank of England took place, and the discount rose nearly fifty per cent. in the course of the following twelve months. That was supposed to be caused by the breaking out of the Russian war; but now, though other twelve-months have elapsed, though the pressure of war is very much greater than it was, and though unfortunately there was no immediate prospect of a termination of the war, still they found the Bank of England in such a position, and so much gold had come back that they had been able to reduce the rate of discount nearly to the rate at which it was previous to the harvest of 1853. The principal cause in producing that was the good wheat crop of 1854. If they wished to estimate the quantity of wheat grown in this country, they were met by the great want of agricultural statistics. But they had the means of measuring it by the amount of foreign wheat and flour brought in, and in nearly twelve months which had elapsed since the harvest of 1854 there had been imported three or four millions of quarters less than in the correspond-ing period after the harvest of 1853. He believed he should be understating the amount when he said that in consequence of that good harvest the country had saved ten millions, which was a good instalment towards paying the expenses of the war. Having shown the great difference in a monetary point

of view, between a productive and an unproductive crop, he would go at once, as they had no control over the seasons, into the question as to how, by all the means in their power, they were to make the wheat crops more productive. He believed the great difference between a productive and an unproductive crop was to be found in the great difference in the numbers of grains in the ear. In all moderate crops there was very nearly the same number of stems to the head, and he had brought with him a single sample of wheat which was grown in 1854—the same kind of wheat, and grown on the same land as a crop he had in 1853, and he would tell them the difference in the number of grains in the head. This was a picked sample, one of the largest heads he could find, and it contained seventy-nine grains. In some quite as large heads grown in 1853, and of the same kind of wheat, the number of grains only reached from twenty to thirty, and those were extremely small. The crop, in which the best heads contained from seventy to eighty grains, produced rather more than five quarters to an acre. The crop of 1853 looked equally well, and had fully as many stems as the other; but he found that it only contained two quarters an acre. It was, however, a splendid-looking crop, and he thought he could engage to prove the proposition with which he began—that the great difference in the yield was chiefly in the number of grains in the ear. Mr. Thompson then exhibited two specimens of oats. The stem of one of them was unusually large; it was taken from a ten-acre field, and there were nearly 600 grains to a single head; whilst, on the other hand, in an ordinary crop of the same kind of oats there were only thirty or forty grains in one head. The question was, in what way could they do any thing to render those heads productive and valuable. For the last fifteen years he had farmed some land which was bought for £6 10s. an acre, and was let for about half-a-crown an acre for many years afterwards. That land is now let at 50s. an acre, and was as good arable land as any in his neighbourhood. When let at the low rent it was a blowing sand, but by a course of improvements it was now capable of producing five quarters of wheat per acre. There was no royal road to farming; and, if they wanted to get their land into a really first-rate state of productiveness, it must be by patient steps of improvement carried over a considerable number of years. Some people thought it was madness in him to put 100 loads of clay per acre on to his light land; but he was of opinion that every load of clay he put on had been extremely well laid out. He had lately visited one of the best Norfolk farmers, who had told him it had been the custom there to put on the light land thirty or forty loads of clay per acre, and to repeat that about every twelve years. The land had, in consequence, so altered in quality that it was almost impossible to recognize it again. This farmer was a great Protectionist a few years ago, and he said he would not care for free trade if he could grow what he liked on his land. By the means to which he had alluded blowing sandy soils have been converted into fertile land, and he believed much more might be done in this country than had ever yet been attempted. They might cart their clay or marl in winter, or at other times when their men and horses had little to do. It was a permanent improvement if they put clay on sand when pretty level; and it was one which tenant-farmers might introduce with advantage. He believed that if they set to work with their land to put clay or marl on the light land, and sand on the clay land, or burnt or deepened it, combined with a thorough exposure to the atmosphere, after a few years they might bring such land into a more productive state. He thought they might make those improvements without laying out a large capital at great risk, and he did not see why they should not bring both their clay and light land into a good position, and to a near approximation to the land of the Norfolk farmer he had mentioned.

Capt. LEGARD said, as a sailor it might seem out of the way for him to take so early a position in the discussion of the evening. He told them candidly that he had come prepared to offer a few observations, not to give a lecture upon the best mode of growing wheat, but rather to suggest a few questions which seemed to him to be of importance. They had heard what his friend Mr. Thompson had said as to the claying of sandy soils. He, however, should not enter into any discussion as to the growth of wheat upon sandy soils, for he thought that the sand had better go to the clay than that they should bring clay to sand. There is a great deal of clay land, either wholly uncultivated or only half cultivated, which is capable of producing a very much larger quantity of wheat than it does at present, and it appeared to him that they had better bestow their labour, ingenuity, and capital upon that description of land than in bringing light land to grow wheat. He would not go into the question of the money value of wheat, because it had been already noticed. He viewed it, however, in a different light. They had 30,000,000 mouths to fill in this kingdom, and as it was calculated that each person consumes a quarter of wheat annually, if wheat varies in price £1 a quarter, to the consumers that is a loss of £30,000,000 a year. The difference between last year and the year before was £60,000,000, which was equal to £2 a quarter a-head through the whole population, so that there could be no question that the productiveness or non-productiveness of the wheat crop greatly affected the money market. It was simply a question of paying 30, or 40, or 50 millions more for the main staple produce of the country in one year, as compared with another. But to come to the question of growing wheat. In the first place allusion had been made to the draining of the land. Well, he apprehended that, in the first place, they were all agreed as to the necessity of draining the land. The Government had taken an interest in this question, and had employed men of talent to conduct extensive schemes of drainage throughout very large districts of country, and these gentlemen recommended that drainage should be carried to a depth of four feet at least. He was not prepared to maintain the assertion for general adaptation, but his experience had led him to believe that they might drain clay lands too dry. The cold clays, whatever might be said against them, were proverbial for producing the best wheat. In illustration of the truth of this assertion, he would refer to Poland and Russia, which countries produced a quality of wheat which we cannot produce in this country, and which always take the top price in our markets — generally speaking the best and only criterion as to quality. Again, in Canada they cannot produce such good wheat as we can. Why? Because they have colder winters and hotter summers. What does this show? It shows that a quick hot summer does not suit wheat, which likes to be kept cool; and consequently, as he held, a cold backward spring generally produces the best harvest. Therefore he thought they might drain clay land too much. And really this was a very important question, because people were apt to run into extremes. Clay land, as they all knew, when in a state between wet and dry, always works better than in any other condition. Therefore they ought surely to be cautious how they deprived it of all its moisture. The next question had reference to the depth to which they should plough. Now he lived in a district where there was a great prejudice against deep ploughing; for, said people, if we plough deep, we plough up a nasty kind of yellow stuff that will grow nothing. On the face of it,

that was a very strong argument against deep ploughing. But they had been led to ask, what is this nasty yellow stuff? And Mr. Coleman, who had obtained a prize for the best essay on the barrenness and productiveness of land, had told them that this was yellow clay, the colour being produced by protoxide of iron. They asked, next, what is protoxide of iron? and the chemist told them that it is merely iron with one equivalent of oxygen. Then came the question, how is this yellow clay to be brought into a proper condition? The answer was, expose the yellow clay to the atmosphere, when it will take up two other doses of oxygen, which will convert it into red clay land. Nor was this stepping in between the scientific investigator and the practical farmer, which he thought was the right course to be pursued. It was of very little use any chemist merely telling them such fine names as he had enumerated; but when they were enabled to discover why this clay was yellow, and how they could make it red, so as to grow wheat well, such information became most valuable to those who had got this yellow clay to deal with. The very town in which they were then assembled had been famous for a great number of years for the quality of its flour, not only in the West Riding, but even as far as London. This flour was not the produce of wheat grown on the wolds, for Malton enjoyed the celebrity due to its flour long before corn was grown upon the wolds. The Malton flour is produced from corn grown in the vale of Pickering, which was originally a lake, and the soil is nothing more nor less than mud. He believed that this mud extended a yard deep; and yet, notwithstanding this very peculiar nature of the soil, when the seasons suited it, it would produce very abundant crops of wheat, so much so that many of the farmers were under an impression that if they grew wheat upon clover stubble, it grew so luxuriantly that it would be thrown down by the first wind or storm of rain that came. Well, when they told him this, he said, the fact is you have got a better horse than you know how to ride—(laughter)—break him in, and depend upon it, he will carry any weight you like to put upon him. Now he had been successful in growing heavy crops of wheat, and the question he should like to ask of a society like this was, how are we to meet the difficulties I have pointed out? If they grew wheat abundantly, it fell down: there was a weakness in the straw; and this land in question having no stones in it, became so loose with moisture that the roots broke out with the weight of the straw. He had drawn out a table to help him in this matter, in which he first set forth the technical names the chemists gave them as representing the constituents of the wheat plant; then he took 4½ qrs. of wheat as a good average crop, and ascertained how much of these ingredients should be in the straw. On comparing the several lines of this tabular statement, he found that guano is so nearly identical, in its analysis, with wheat, that it might almost be wheat itself. No wonder, therefore, that guano should be a good manure for wheat, and for a certain quantity of guano applied they realized a far greater quantity of wheat. Then they came to the great question of the rotation of crops; and upon that point he was prepared to maintain that if they knew how, they might grow wheat every year in succession, for any number of years they liked. They had only to supply the constituents, and they might grow it for ever, the only question being that of economy, as to whether they could grow it at such a price as the market would pay. Wheat must have its constituent parts. As to the straw, that which stiffens it is the silica it contains, and the chemists say that you must wait for two years to enable the atmosphere to reduce the silica in the land. What the farmers, then, wanted to know was this, is there no chemical substance that we can apply to the soil which will so reduce the silica as to enable us to grow wheat every year? He believed what they required was silica of potash or soda, to reduce this silica, so as to enable the straw to take it up, and so secure strength to maintain and sustain the crop. Lime will accomplish this work, as will also salt, the recommendation of the latter article being that it is cheaper and that a less quantity will be required. The fact is that the stiffening of the straw of wheat is to be effected by the same process that is used for the glazing of a common blacking bottle. You see the blacking bottle glazed outside, and it is made of the clay which grows our wheat. But in the manufacture of those bottles they do not put silica into the kiln, but salt, which acts as a flux upon the silica, causing that upon the surface to run off, and so the bottle becomes glazed. This was just what they wanted outside their straw. They wanted to know of some cheap mode of accomplishing this, and if they could ascertain it, he had no doubt they could grow wheat every year for as many years as they liked. He next entered upon the fallowing question, contending that some of the existing prejudices upon this subject ought to be done away with. He referred to the agreements enforced by landlords as to the rotation of crops, contending that if the farmers of this country were to be required to produce food for the people, independent of foreign supplies, they ought not to have their hands tied, but be allowed to grow the greatest quantity of wheat they could, in the best way they could. The land, which he regarded as a machine, ought to be put into the hands of men possessed of intelligence and capital. If they turned out bad farmers and injured the land, and picked their landlords' pockets, let them be discharged; but if they were good farmers, they would not only serve themselves and the community, but they would not and could not rob their landlords.

At the request of Mr. Cayley, who himself said a few words on the subject,

Mr. G. Legard, in alluding to what had fallen from his relative (Captain Legard), said he confessed he had very great doubt whether, under any circumstances, they could grow wheat on the same soil year after year. He was perfectly aware, from the Journals of the Royal Society, of the experiments on this question which had been made by the Rev. Mr. Smith, in Northamptonshire, and that this gentleman professes to be able to grow the same crop on the same soil year after year. But in reality he did not do so; for he believed the seed was sown one year at intervals of about a foot, and after the harvest the interstices between these rows were cultivated for the next year, the ground being deeply ploughed or scarified, or something of that kind. The Northamptonshire land was noted for its fertility, and this might in some degree account for the success of Mr. Smith's experiments. Adverting to the subject for discussion, the causes affecting the productiveness of the wheat crop, he remarked that this might be read in two ways—the causes which are calculated to promote the growth of wheat, and those which may retard or impair its growth. What they required to know as practical farmers was, what species of manure they ought to apply to the different descriptions of soil. They should endeavour to obtain a more general knowledge of the different kinds of soils than they now possessed, and, having secured this, farming operations would advance far more quickly than they had done, and agriculture would become a more certain science than it had hitherto been. If owners of land now required to know the character of the soil which they occupied, they sometimes applied to geological maps; but he (Mr. Legard)

did not think these could be of the slightest use to practical farmers, inasmuch as those maps generally displayed the rocks below, while the agriculturist required information as to the deposit covering the rocks. An opportunity, however, was now offered so remedy, in some measure, this defect, Ordnance maps having been recently published, on the scale of six inches to a mile; and if these maps could be coloured so as to show the character of the soil above, and not the rocks below, much good would be the result to agriculture, and it would do more to assist the productiveness of wheat than anything he knew of.

After a word in favour of deep drainage from the chairman, Mr. THOMPSON, in reply to Captain Legard, said that if draining was to be good for anything, it must be calculated to increase the moisture at the dry season, as much as it diminishes it in wet. Captain Legard had said they could not obtain anything more from the land than they put into it. In reply to this, he reminded the meeting that it had been incontrovertibly proved by Mr. Lawes that for twelve years he had not put anything in as a crop, but his land had produced 17 bushels an acre, and they had only to look at any wild hillsides, and see the large and luxuriant vegetation, where nothing is put in. Reference had also been made as to the capability of growing wheat year after year on the same soil. He believed this might be done on a single field; but so many practical impossibilities arose the moment they began to extend the question to the whole country, that he was induced to think such a system could not be satisfactorily adopted. They might cultivate wheat on this plan on some land; but if the system were applied to an entire farm, they would have all the labour to do within a few weeks, and they would be standing idle for nearly all the rest of the year. It had also been stated that a backward spring was a good preparative for the wheat-crop. The climate of Poland and other wheat-growing districts had been appealed to, but he contended that the superiority of Poland as a wheat-producing district consisted in its very dry climate and hot sun, and not in its superior mode of cultivation. The best seasons we had had in this country—in the years 1834, 1826, and 1825—were those in which scarcely any rain fell during the summer, when the weather was extremely hot, and when there was a great deal of sunshine.

Captain LEGARD thought that in principle he was right, and that if they put nothing in the soil they could take nothing out. He had stated that the atmosphere, independent of the land, supplies us with 96-100lbs. of the wheat crop; and he had also said that the very small quantity of other ingredients they required were very generally present in the land. If the land did not possess these ingredients, it would not grow wheat unless other ingredients were introduced, and they would therefore have to put something into the land before they obtained anything from it.

Sir GEO. STRICKLAND, having next addressed the meeting, called upon

Sir TATTON SYKES, who said, as far as his opinion went their grand object should be to make their straw into as good manure as they possibly could. If they did this, they need not study chemistry so much. At the same time they would allow him to say that the landlords should afford such conveniences for their tenants, in order that they might produce this kind of manure to as great an extent as would be needful for them. He referred them to Mr. Jorricks, who came all the way from London, with a view of making his fortune, by the exhibition of some wonderful exploits in agricultural science. In the course of his peregrinations, however, he met with an honest, rough-spoken, Yorkshireman, who, having listened to the oration of Jorrocks upon the capabilities of artificial manures, guano, gypsum, and so forth, called out, "Muck's your man, Master Jorrocks, muck's your man!" (Hear, hear, and loud laughter).

The proceedings terminated with some remarks from Mr. HARTAS, of Wrelton.

DRIFFIELD AND EAST RIDING AGRICULTURAL SOCIETY.

The second annual show of this flourishing and important society was held at Driffield, on Wednesday, July 11. The district to which this society extends is perhaps the most interesting in the agricultural world. The East Riding of Yorkshire has always been famed for its splendid breed of coaching and other valuable classes of horses; its cattle are of a superior kind, and its fat sheep can scarcely be surpassed by any in the kingdom; the farms are large and highly cultivated, and the farmers wealthy, enterprising, and intelligent. Possessing all these elements, this society could not fail to assume an important position; and its very first show proved that it was only second in importance to the great county society. Nearly £400 were offered in premiums at the present show, and there were upwards of 900 entries. Many special premiums were offered by private individuals for certain descriptions of stock. The show was held in a field near the King's Mill, and presented a splendid array of shorthorns, sheep, horses, and pigs. Some of the cattle would have done credit to Smithfield, and there were no less than 250 entries of beautiful horses. The poultry was most numerous, and some beautiful specimens were exhibited. There was also a very large display of machinery and implements, the object of the committee being particularly directed to the encouragement of implements combining novelty of invention and practical utility; and for the promotion of this object a very handsome sum was set apart in premiums. A new and pleasing feature at this show was the exhibition of specimens of approved manure; for we think the produce of abundant crops is of equal importance to the agriculturist as the rearing and feeding of superior stock. Amongst these were samples of ammonia-phosphate, for wheat, oats, barley, and grass; and nitro-phosphate, for turnips, rape, and other bulbous-root crops, manufactured by Hodgson and Simpson, Wakefield, and Matthews and Co., manufacturing agricultural chemists, Driffield. These manures were stated to stand peculiarly high in the estimation of the public, having stood the test of eight years' experience by most of the leading farmers in Yorkshire and Lincolnshire. The nitro-phosphate has been proved to be the best substitute for guano as a manure for turnips, being the most rich in the elements which give so much value to that celebrated manure. It is also valuable from its highly-concentrated state, and, by means of a drill invented by Mr. Matthews, can be drilled by itself, without any mixture of ashes or riddled soil, at the rate of from two to two and a-half cwt. per acre, which is sufficient to produce an excellent crop of turnips, and the seed is not in the least injured, thus effecting a saving in the expense of carting, mixing, and manual labour of from 4s. to 6s. per acre: this economic drill obtained a prize. The show

attracted an immense concourse of people, who early poured into the town, which was very gay with flags and banners of several nations, suspended across the streets leading to the show ground. Wilson's celebrated sax-tuba band from Burlington Quay was stationed in the field, and materially contributed by its sweet strains to the animation of the scene. All things seemed propitious for another most successful show, except the weather, which was very watry. About 5,000 persons had entered the ground, and thousands more were proceeding when the rain came down in torrents, and of course put a stop to further entrance, and those in the field were glad to make their way out to find shelter in the town. Notwithstanding this drawback on the success of the exhibition, the receipts at the gates amounted to between £200 and £300, something less than last year. The receipts would no doubt have exceeded those of last year had the day continued fine. The following gentlemen acted as judges, and fulfilled their duties with great satisfaction :—*For short horns*—John Angus, Esq., Bearl, Stockfield; Charles North, Esq., Alford, and T. Crofton, Esq., Holywell. *For sheep*—R. J. Wilie, Esq., Hornby Castle; William Bell, Esq. Gleadthorp; W. Hunt, Esq., Wortly. *For horses*—S. Robson, Esq., Caseby; J. Newton, Esq., Old Malton; H. Clark, Esq., Elliuthorp Hall. *For poultry*—T. Chaloner, Esq., Burnt Leys; J. O. Jolly, Esq., Acombe; F. Ferguson, Esq., Walkington. *For implements*—Mr. J. Hotham, Lurd; Mr. J. Wheatly, Neswick; Mr. S. Stavely, Tibthorp, and Mr. P. Dunn, Sigglesthorne. The following is the award of prizes :—Bulls—Messrs. Barber, Wright, Smith, Dawson. *Cows*—Messrs. Jordan, Wilson, Thompson. *Heifers*—Messrs. Thompson, Ferguson, Jordan. *Ox*—Mr. G. Taylor. *Sheep*—Messrs. Augus, Simpson, Holliday, Borton, Holtby, Dawson, Woodcock. *Horses*—Messrs. Smith, Stockdale, Holtby, Fawcett, Ramsdale, Crompton, Simpkin, Jordan, Hopper, Wright, Robinson, Midgley, Stavely, Lovel, Johnson, Harrison, Holliday, Laybourne, Jackson, Preston, Dawson, Collier, Angus, F. C. Matthews. *Pigs*—Messrs. Wiberfoss, Anderson, Donkin, Munroe, Scott. *Horses extra*—Messrs. Jordan, Wheatley, Kirby, Newby. *Poultry*—Messrs. Barker, Nicholson, Taylor, Richardson, Turner, Smith, Sigston, Graham, Holt, Maw, Black, Boothby, Arkwright, Simpson, Dales, Martin, Britain, Marshall, Cobb, Denton, Golden, Spedding, Charters, Simpson, Conyers, Ringrose, Hotamh, Dunn, Tindall, Ridsdale, Willy, Dixon, Jarrat, Rounding, Dawson, Conyers, Angus, Bielby, Charters. *Implements*—Messrs. Anfield, Sawney, Morton, and Co., F. C. Matthews, (Drill) Calvert, Belt, Fleetham, Gibson, Dale and Jackson, Scrivener, Moon, Buxton, Johnson, Crosskill, Wright, Pickering and Houlgate.

A public dinner took place in the Corn Exchange at 4 o'clock, and was numerously attended. The dinner was provided by Mr. C. Hopper, of the Red Lion, and Wilson's band played in the orchestra. The room was gaily decorated with national flags, in which those of the allied armies were conspicuous, and in different parts were appropriate local and loyal inscriptions. In the room and on the show-ground were the following distinguished noblemen, clergymen, and agriculturists :—Lord Hotham, M.P., the President of the Society, the hon. Capt. Duncombe, M.P., the rev. R. C. Wilmot, the rev. J. Blanchard, the rev. J. W. Bower, James Hall, Esq., James Hall, jun., Esq., Godfrey Wentworth, Esq., Richard Dunn, Esq., H. Woodall, Esq., Jonathan Harrison, Esq., E. H. Hebden, Esq., Major Constable, D. Burton, Esq., E. Smith, Esq., Y. Yarburgh, Esq, T. Prickett, Esq., G. Legard, Esq., T. Sykes, Esq., Major Arkwright, F. C. Matthews, Esq., T. Hopper, Esq., F. Jordan, Esq, W. Angas, Esq., H. Parker, Esq., E. D. Conyers, Esq., J. Milner, Esq., J. Dickson, Esq., J. Harrison, Esq., T. Dawson, Esq., &c., &c. Lord Hotham, the president, presided, and proposed in succession the loyal and other toasts. In replying to the toast of the archbishop of York and Clergy, the Rev. J. Blanchard said he rejoiced at the prosperity of agriculture, but he hoped they would never let the poor be forgotten, for they would materially suffer while flour was 3s. per stone. Geo. Legard, Esq., proposed "The Allied Armies," which was replied to by Lord Hotham in some very appropriate remarks on the proceedings in the Crimea, which were most attentively listened to, as coming from an old soldier. J. Hall, Esq., was enthusiastically cheered on rising to propose, "The East Riding Members." The Hon. Capt. Duncombe responded, and was loudly cheered. "The Driffield and East Riding Agricultural Society" was proposed by Richard Dunn, Esq. He observed that though many years had elapsed since he resided amongst them, he had watched the progress of their agriculture with no indifferent eye. He spoke in eulogistic terms of the marked improvement which had taken place, and made special allusion to Sir Tatton Sykes, Mr. Legard, Mr. Wheatley, Mr. Angus, Mr. Staveley, and other well-known agriculturists of the neighbourhood, whose names were received with applause. Mr. T. Hopper responded. Mr. Jonathan Harrison proposed, "The Judges," and Mr. Crofton replied, and spoke in high terms of the superior quality of the stock exhibited, which he little expected to see at a local show. Mr. Smith proposed the unsuccessful candidates. Mr. F. Jordan responded. Mr. W. Angus, in an excellent speech, proposed, "The Landlords of the East Riding." Captain Duncombe responded. "The Tenantry of the East Riding," "The Labourers," and "The Ladies were also given. The meeting broke up about 8 o'clock. There were afterwards a concert and ball.

EXPENSE OF REARING CATTLE in Argyleshire and the West Highlands of Scotland, where the kyloes are reared, and which are so much admired for beef :—

	£	s.	d.
To milk to the calf while sucking, 1½ Scotch pints daily, 3 English, at 2d. per pint ..	2	5	6
To expense of keeping the calf housed, and fed on straw and hay during the first winter 12s., minus 3s. for manure	0	9	0
To pasture next summer on hill grass.....	0	7	6
To keeping next winter on low grounds....	0	10	0
To pasture on hilly ground next summer, being then 2½ years old.....	0	7	6
Risk of deaths	0	15	0
Interest of money	0	5	0
Total....	£4	19	6

NEW BREED OF FOWLS.—Since the war with Russia a new kind of domestic fowl has been introduced into England from the Black Sea, and is likely to prove a formidable rival to the Shanghai and Cochin China. It is quite as large as the barn-door fowl; is crested, and has feathered legs. Its colour is generally all white or black—when the latter, of a raven hue, and glossy. This bird is pugnacious, and its movements are very lively. Its most distinguishing peculiarity is, however, in the arrangement of the tail feathers. These are very few, and do not project as in other birds, but drop down and lie close to the body, so that the creature appears tailless, and when his head is erect scarcely has the appearance of a bird. Several of these birds are to be seen at Southampton, where they have been landed from the war transports.

THE ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

MEETING AT CARLOW, AUGUST 8.

The Royal Agricultural Improvement Society of Ireland has of late had by no means a happy time of it. This is the more remarkable, as almost every other association of a similar character has been advancing under the most favourable auspices. There is no good reason either why such should not be the case here. It is, indeed, only right to say that the general body of the members are in no way implicated in what has recently occurred. That the Irish Agricultural Society has been going back instead of going forward—that it has been bartering the good name and repute it had so honestly earned, for something very like the reverse—is almost entirely attributable to those who have made themselves amongst the most officious on its direction. None in the habit of seeing the Journal which so carefully records these proceedings but will admit this to be the case. For the last half-year or so it has been one continued chronicle of cross-purposes, of childish disputes, and petty personalities, that would be simply ludicrous, if they were not at the same time in their effect yet more really lamentable. It is monstrous that the members of a national society should have countenanced or have suffered this so long as they have done. It is to be regretted that those noblemen and gentlemen who do feel an interest in the prosperity of the association, had not used that influence they possess, and at once put down a squabble as detrimental as it is derogatory. We say, advisedly, that the Royal Agricultural Society of Ireland has had a grievous wrong inflicted on it by some of those to whose care its welfare had been entrusted. It will be a duty to ascertain who these are.

It would be worse than affectation to assume an ignorance of this. It would, in fact, be impossible to do so. Their own Journal, we repeat, has informed us, month after month, how certain members of the council, and the secretary of the society, are at deadly war with each other. How, instead of endeavouring to establish their acting officer in a becoming position, every effort has been tried to make him ill-disposed and uncomfortable. How committees have passed rules and regulations altogether beyond the pale of reason or of precedent, and purely as it would seem to gratify some pique or prejudice of their own. How those upon whom these new laws were to act, have refused to obey them; and how a general meeting of the members have refused to sanction them. This general meeting certainly did one sensible thing: either directly or indirectly, it censured everybody concerned in the altercation they had been called upon to consider. But they might well have gone beyond this. Can any men whose whole time and energies are engaged in blind quarrels one with the other, be considered qualified for the offices they yet hold? Let them injure themselves as much as they choose. But surely it is too much that they should at the same time be permitted to deeply injure and debase what should, and what might be, so great and so good a national institution.

This is a serious and a painful question; but it is one which, if the Society is to advance as it should do, must be considered. Have these gentlemen, by their temper, discretion, and a feeling wholly irrespective of self, shown that they are still worthy to fill the places to which they have been elected? Have they proved by their acts that their first and, indeed, only care has been the well-doing of the society? Or, have they suffered personal considerations to influence and misdirect the discharge of their public duties? Somebody must be grossly wrong here. Is it with these members of council, or with their secretary? If the latter be really in fault, the remedy is easy enough. If, on the other hand, more sinned against than sinning, let him have that support he should have. We say again, that we take our views of this matter entirely from the reports of the Journal of the Society. It is said, however, that those most hostile to the present secretary are those who are, or who have been themselves candidates for the office!

We speak thus plainly with only one object. We want fair play for the Society. We want to see it allowed at least that chance of success which at present some of its own body are doing all they can to deny it. There is no doubt it is getting a bad name. We crossed, on our return from Kingstown, with an Irish gentleman, a landed proprietor, and himself a practical agriculturist, who, as a member of the society, admitted far more than is said here. If any further proof were wanting as to what all this has already resulted, or will result in, it is in the fact that the funds are rather decreasing than increasing. It is just now a question whether this same monthly Journal shall or shall not be continued. Not that this can be a matter of any great importance. From what we have heard, we should say it costs far more than it is worth. At best it is little more than a bad compilation, and quite unworthy to be the organ of such a society. Its chief use of late —at least in its own original department—has been as a "Scandalous Magazine," to report proceedings which never ought to have occurred.

The more we see of the Royal Agricultural Improvement Society of Ireland, the more convinced are we of what great good it is susceptible of being turned to. If such associations are of use in England and Scotland, they are now doubly so in Ireland. The people are becoming more and more alive to the object they encourage; and if such a national Society does not prosper—if it does not maintain that influence it should have, it must be mainly attributable to a want of good management. It is not, moreover, the people of Ireland alone who will

support it. The English and Scotch are quite as willing to do so. Breeders have already sent over their picked stock, and our implement makers are nearly all following them. The Carlow show of implements was by far the best the Society has ever had; while it is satisfactory to know that our manufacturers left it well contented with what they had done. The Irish never previously took anything like the interest in this department they did here; while the orders given were proportionately on the increase. We believe there was not an English exhibitor on the ground but who will "come again." Could there be any stronger sign of "agricultural improvement?" or, could an Agricultural Improvement Society turn to a better test of what it is effecting? A finely-bred, good-looking animal is often enough but a "fancy." When, however, we see the practical farmers of the country examining, approving, and purchasing the best implements, we feel that the reign of prejudice and ignorance is really over, and that of "improvement" as certainly commenced. Improved ploughs, drills, and reapers are the pioneers, while the steam-engine and the draining-machine will as surely follow. We have achieved that greatest of all recommendations for a good "genuine article,"—an introduction.

We had nearly added, and a trial; but in the show proceedings, at least, this is scarcely so complete as it might be. The only implements of the many distinguished in the prize-list at Carlow which underwent any test against each other were, we believe, the ploughs and the reapers. In the latter, in fact, there was no competition. Crosskill's "Bell," though entered, was not sent; nor, indeed, was there anything from the Beverley firm. Mr. Dray had it, consequently, all his own way. It is only fair to say that the machine well deserved the premium awarded. We saw it put through a severe ordeal on the Wednesday, when, contrary to the general expectation, it performed admirably. The crop was a piece of unripe, foul oats, with a drizzling rain falling at the time, and a pair of by no means the best broken horses. The work still was nearly all that could be wished, and the effect on many, to whom the invention was a novelty, palpable enough. We were told it went yet better the next day in wheat, with plenty of entries in the order-book, as the most grateful and substantial compliment to its merits.

The trial of the ploughs was rendered more than usually interesting from those of Messrs. Ransome and Howard being again brought into competition with each other. The race this year has been especially with the lighter or general-purpose plough, the struggle for which has been rather remarkable. At the West of England Meeting at Tiverton, the judges, after much consideration, confessed that they could not say which was the best, and so divided the prize between them. At Carlisle these two again singled themselves out from all other competitors; although there, on the other hand, the gentlemen in authority were not anything like so long making up their minds, but gave the prize to Ransome, and a high commendation to Howard. It is only right to say, as we did at the time, that the general opinion was dead against them. The first and second places, it was maintained, should have been reversed. They met once more in Ireland last week, and here they were reversed. With the same ploughs and the same men, the judges gave Howard the prize, and Ransome the commendation. After all, we believe there is, in reality, little choice between them. An implement-judge of very long experience in the Royal English and other societies, assures us it is the nicest point he has ever been called to decide on. In their present improved state, Howard's plough does the best work, while Ransomes' has a little the lighter draught. Both have obtained capital introductions for themselves amongst the Irish farmers.

It would be superfluous to follow out a prize-list which includes the names of makers and implements so well known, and of which there were no trials to record. This is a matter which requires some further consideration from the Society. It would be far more satisfactory for both buyers and sellers that some proof should be offered of the working value of the inventions exhibited. Our English makers have a particular objection to putting their implements in competition, and the award being made, without some trial over them. Nothing can speak better than this on the one hand; while nothing would tend more to establish confidence, and facilitate the use of improved machinery, on the other.

It will be found, though, that, even without this test, the judges were enabled to arrange the awards much as they have run of late. Ransomes once more stood first with the heavy plough; while the same firm occupied an equally high and as well-accustomed a position with the steam-engines and thrashing-machines. Garrett's drills received only a further confirmation of their almost unapproachable excellence; and the same maker, it will be observed, took both the premiums for the manure-distributors, with Chamber's invention for the portable, and Spooner's for the application of liquid manure. The Howards had their harrows and horse-rakes; although with the latter — the first at Carlisle—they had here to give place to Smith and Ashby, who also turned out a hay-maker, and a cheap farm-cart, that both appeared to "take" greatly. Coleman, from Chelmsford, and Gray, from Belfast, had their several kinds of grubbers, both well appreciated, and Richmond and Chandler were once more deservedly in the ascendant with their chaff and turnip cutters. The prize list also bears favourable testimony to the presence of Stanley, from Peterborough, of Miller, from Dunbar, Edmonson, and Sheridan, from Dublin, and Mr. Spong, on his own ground, with a careful selection of seeds and grasses. Beyond these, we had Messrs. Bigg and Long still on the circuit, healing the sick, and as energetic as ever in their appeals to flockmasters. Surely, as Sterne says, "there is room for them both."

If the implement exhibition at Carlow was far superior to anything of the kind the Irish Society has yet been able to offer, the show of stock, on the other hand, was as decidedly below what we have seen of late at these meetings. Compared with that at Armagh, the falling off was but too appa-

rent. Cattle, sheep, and pigs were all there much better than here. We have only to hope that the unhappy squabbling to which we have referred cannot yet have tended to this defalcation. It is still very certain that many Irish gentlemen, who have hitherto been exhibitors, did not enter on this occasion. The most apparent lack of support, however, was from England and Scotland. Mr. Towneley, whose famous Shorthorns have long been one of the most attractive features, both at the Dublin and the Irish provincial shows, had not an animal in the yard. Mr. Booth, who last year gave Armagh the preference to his own county meeting at Ripon, this season reversed his tactics, and stopped at home. Mr. Douglas, again, though he sent a few sheep, did not allow the Rose of Summer to repeat her visit, or any other of his shorthorn stock to appear; and Mr. Stratton's entry was not in her place. It was said that the Irish show followed too closely on that at Malton; but Mr. Beale Browne's Cotswold ewes were at both meetings, having now, in fact, been exhibited at the three—Carlisle, Malton, and Carlow—at all of which they were winners. Still the journeying from Yorkshire to Carlow must have been hard work, considering the short interval between the two; and we have no doubt this kept many of the picked animals of our English herds from adding, as they have been wont, to the excellence of the annual meeting in Ireland.

This difficulty had still the advantage associated with it of showing us how far our Irish friends can depend upon their own resources. One fact is now evident enough. The Short-horn, as a national breed of cattle, is indisputably established in the sister kingdom. The entry here, though not so large as it has been, was numerically strong, while the catalogue showed how generally the race is by this distributed throughout the country. The different strains, too, appear to be very carefully preserved, and scarcely a beast is to be met with without a pedigree following its name and age. But perhaps, after all, the best proof as to how the Short-horn is making its way in Ireland, is that at this exhibition, of essentially Irish cattle, the young stock were generally superior to the aged. Not that the latter can be recorded as having been by any means indifferently represented. Nearly all which took prizes on this occasion had taken them at previous meetings in Ireland. The first prize bull, for instance, was a winner at Killarney, while the first in the next section—Lord Monck's white beast—was also the first in his class at Armagh. Notwithstanding this, however, the gold medal for the best bull on the ground was very properly awarded to a yearling, the property of Mr. Kearney; not only a remarkably fine-grown animal, but of a very excellent quality—a point, by the way, in which the aged bulls were almost generally deficient. They were altogether surpassed by the cows, which, in addition to the prizes, included two very fine beasts from Lord Monck's herd. From what we saw of his stock generally, his Lordship promises in time to take high rank as a breeder of Shorthorns. The cows, again, good as *some of them* unquestionably were, had to succumb to the heifer classes, nearly all of which were superior, and one or two of them of very great merit. It will be observed that Mr. Campion's two-year-old "Romp" took the Purcell Challenge Cup, as "the best animal in the yard." Captain Ball shared with Mr. Campion the chief honours of these classes, and deservedly so, too; while Mr. Christie followed the former gentleman with the cows. He was enabled to place the second prize side by side with two other useful animals, and so to carry off for the third time in succession the Towneley Tenant Farmer Challenge Cup, which thus becomes his property. He had no competitor; and indeed, the classes referred to scarcely tell as yet. There were six extra premiums "to be competed for by bona fide tenant-farmers not paying more than £100 a-year rent," which did not bring a single entry. The hundred-a-year is clearly too low a limit for an exhibitor at a great national meeting like this.

The "other breeds" of cattle reached in Devons five animals to compete for four premiums—four polled Angus for four premiums—with a few Ayrshires and Kerrys. In the Galloways and West Highlanders there were no entries. This branch of the prize-list clearly wants remodelling. The money might be applied with much greater effect in other ways.

If the show of shorthorns was an unequal one, so assuredly was that of the sheep. The display of Leicesters at Armagh last year was remarkable for its general excellence. That at Carlow was by no means so perfect. There were some very ragged lots—well-balanced, however, by those of Mr. Campion, Mr. Hamilton, Mr. Douglas, and other breeders who have already established themselves. Mr. Campion, indeed, carried all before him; and his sheep have all the same look and "character"—a sure sign of the care with which the flock has been bred. In the other longwools, Mr. Rait and Mr. Kerr were the most successful exhibitors; although Mr. Beale Browne's pen of prize Cotswold ewes attracted more attention than any other entry in sheep classes. Their repeated successes have given them now something of a well-deserved celebrity, and they were pronounced to be the best lot of Cotswolds ever seen in Ireland. A short show of Cheviots and a few good Southdowns complete this department, which, as a whole, might have been better.

There was nothing struck us more at Armagh than the extraordinary exhibition of Berkshire pigs; nearly all, if we recollect aright, bred in Ireland. There could not have been a more satisfactory proof as to the justice done to imported stock. Strange to say, however, nowhere was there a more palpable decline than in the show of pigs at Carlow. Both in numbers and merit was it alike deficient. There were some good pigs amongst them, including a few Berkshires; but, on the whole, these were excelled by other sorts. A white Yorkshire boar, from the Albert Model Farm, at Glasnevin, was selected as the best pig in the yard; while Mr. Warburton's Berkshire sows, and Mr. Napper's lot of three white sows, were quite as worthy of commendation. The Carlow show of pigs might "pass" fairly enough did we not remember what the Society has already done in this way, and then the comparison is against it. We

cannot see any just cause, either, why this should go back.

The weak point, after all, of the Irish meeting is, curiously enough, the show of horses. We have so often already dwelt upon this, that we shall say no more here than that on the present occasion some little improvement was to be observed. We trust it may be still further encouraged. The prize and commended horses were chiefly Clydesdales, with some two or three very good mares amongst them. The judges were rather liberal in their commendations, while with the "highly commended" they might with justice have given in a few "severely censured." It is not, perhaps, extraordinary that some such animals as we saw here should be reared, but how they ever came to be shown for a premium is curious. If the Council will take the advice of many of their friends, they will extend the prize-list for horses—take something off the "other breeds" of cattle, and give a good offer or two for hunters and hack stallions. Above all, let them learn how to show their horses. Those at Carlow were boxed up in little narrow cells—they could not be called stalls—in which it was impossible to see more than a horse's head at one end, and his tail at the other. This curious plan, too, was further carried out by a very prominent notice that no animal should be allowed to leave his standing without an order from a steward! Our first idea was, that the Society was thoroughly ashamed of their horse-show, and that they wished the public to see as little of it as possible. Mr. Rait, however, was kind enough to let his horse come out now and then; and some of the mares were also occasionally visible. It was said this was the work of the local committee; but if a fresh local committee is year after year to have the management of the show, it will be a very long time before they get to anything approaching perfection. Cannot a Brandreth Gibbs be found for Ireland?

The dinner, which took place on Wednesday, was very well attended, and very well done by the contractor. Nearly five hundred sat down—to a "cold collation," of course, laid out in the engine-house of the railway. There was only one want—a few stewards, to keep order. As it was, one noisy drunken fellow at the lower end of the table was allowed to disturb the proceedings to the very last. In England he would have been "turned out" or silenced at the outset, and we see no possible reason why he should not have been in Ireland. Lord Carlisle, as Lord-Lieutenant, had the speech of the evening; but he was less happy than usual. It was a rather laboured "figures and facts" piece of oratory, which his Excellency hardly ever warmed up to. We give some other of the speeches which come more directly within the province of our columns. The list, however, was a very long one, and some of the addresses longer still. One gallant gentleman had fairly to be whipped off by the toast-master before he could be brought to leave the line he was running. When will people come to see that a very long speech at a public dinner is a very fatal mistake for the speaker, and a very great nuisance for everybody else?

CATTLE.

JUDGES—Charles Lyall, Kincraig, Forfarshire.
Philamore Tomalin, Carlow.
John Unthank, Netherscales, Cumberland.

CLASS A—SHORTHORNS.

Section 1—For the best bull, calved on or before the 1st of January, 1850, and previous to the 1st of January, 1853, first prize of thirty sovs. to William Owen, Blesinton; second of ten sovs. to Charles Powell Leslie, M.P., Glasslough. Highly commended: Mr. Wm. Talbot's and Mr. Arthur Kavanagh's bulls.

Section 2—For the best bull calved in the year 1853, first prize of fifteen sovs. to Lord Monck, M.P., Charleville, Enniskerry; second best of ten sovs. to the Earl of Clancarty, Garbally, Ballinasloe. Commended: Mr. Charles William Hamilton's bull.

Section 3—For the best bull, calved on or after the 1st of January, 1854, first prize of ten sovs. to J. Kearney, Milltown House, and the gold medal, as the BEST OF ALL THE BULLS; second of five sovs. to Lord Monck, M.P. Highly commended: Mr. John Christie's bull; commended, Mr. Thomas Garde's and His Excellency the Earl of Carlisle's bulls.

Section 4—For the best cow, in calf or in milk, of any age, first prize of fifteen sovs. to Rowland Campion, Old Town, Shanballymore; second of five sovs. to John Christy, Fort Union, Adare. Highly commended: Lord Monck's cow; and commended, another of Lord Monck's cows.

Section 5—For the best heifer, in calf or in milk, calved in 1852, first prize of ten sovs. to Capt. Ball, Robert's Walls, Malahide; second of five sovs. to Captain Ball. Highly commended: Lord Talbot de Malahide and Colonel Kane Bunbury's heifers.

Section 6—For the best heifer, in calf or in milk, calved in the year 1853, first prize of ten sovs. to Rowland Campion, and the Purcell Challenge Cup, as "THE BEST ANIMAL IN THE YARD"; second of five sovs. to Captain Ball. Highly commended: Mr. John J. Turner's heifer.

Section 7—For the best heifer, calved on or after the 1st Jan., 1854, first prize of ten sovs. to Rowland Campion; second of five sovs. to Lord Monck, M.P. Highly commended: Mr. Richard W. Reynel's heifer; commended, Captain Ball's and Mr. John J. Turner's heifers.

The Towneley Challenge Cup, value fifty sovs., given by Charles Towneley, Esq., of Towneley Park, Lancashire, for the best lot of three breeding cows or heifers, of any breed, for general purposes, in calf or in milk, not less than three years of age, the property of a *bona fide* tenant farmer, to John Christy, Fort Union, Adare, for three shorthorns. No competition. Mr. Christy having now won this three years in succession, the cup becomes his property.

The Purcell Challenge Cup, value one hundred guineas, for "the best animal in the yard," to Rowland Campion, of Old Town, for his short-horned heifer.

The Gold Medal for the best of all the prize bulls in the yard to P. J. Kearney, for his yearling shorthorn.

Six extra premiums for cattle and pigs, to be competed for by tenant farmers of Ireland not paying more that £100 per year rent, produced no entries.

OTHER BREEDS OF CATTLE AND MOUNTAIN SHEEP.

JUDGES—Lord Cloncurry.
Thomas Lawrie, Terragleston, Dumfries.
John Lyall.

CLASS B—OTHER BREEDS.

Section 1—For the best Devon bull, calved on or after the 1st of Jan., 1850, the prize of ten sovs. to the Earl of Charlemont, Marino, Dublin.

Section 2—For the best polled Angus bull, calved on or after the 1st of Jan., 1850, the prize of five sovs. to Lord Lurgan, Brownlow House, Lurgan.

Section 4—For the best Ayrshire bull, calved on or after the 1st of January, 1850, the prize of five sovs. to M. Brogan, Albert National Model Farm, Glasnevin.

Section 6—For the best Kerry bull, calved on or after the 1st of Jan., 1850, the prize of three sovs. to William Owen.

Section 7—For the best Devon cow, in calf or in milk, of any age, the prize of four sovs. to Miss Morris, Gortnamona, Tullamore.

Section 8—For the best heifer calved since January, 1852, the prize of three sovs. to Lord Charlemont.

Section 10—For the best polled Angus cow, in calf or in milk, of any age, the prize of four sovs. to Lord Talbot de Malahide, Malahide Castle.

Section 11—For the best polled Angus heifer, in calf or in milk, calved on or after the 1st of January, 1852, the prize of three sovs. to Lord Talbot de Malahide.

Section 16—For the best Ayrshire cow, in calf or in milk, of any age, the prize of four sovs. to Captain Vesey Colthurst, Lucan House, Lucan.

Section 18—For the best lot of two Ayrshire heifers, calved on or after the 1st of Jan., 1854, the prize of three sovs. to N. W. Roche, M.D., Fermoy, county Cork.

Section 22—For the best Kerry cow, in calf or in milk, of any age, the prize of three sovs. to Sir Edward M'Donnel, Merrion-square, Dublin.

Section 23—For the best Kerry heifer, in calf or in milk, calved on or after the 1st of Jan., 1852, the prize of two sovs. to the Earl of Charlemont.

HORSES.

JUDGES—W. C. Spooner, Eling, Southampton.
G. A Boyd, Middleton Park, Dublin.
Thomas Baker, Courtlough, Balbriggan.

CLASS C.

Section 1—For the best stallions of any breed for agricultural purposes, foaled on or after January, 1848, and previous to the 1st of January, 1853, first prize of thirty sovs., also Medal for the best horse in the yard, to Sylvester Rait, Rathmoyle, Edenderry, for a Clydesdale; second of ten sovs. to John Pearson Bewley, Kilmarnock, Priest Haggard, for a Clydesdale. Highly commended: Mr. John Christy's stallion; commended, Mr. Archibald Molloy's stallion.

Section 2—For the best stallion of any breed for agricultural purposes, foaled on or after the 1st of January, 1853, first prize of fifteen sovs. to Sylvester Rait for a Clydesdale; second of ten sovs. to Captain M. C. Banbury, R.N., M.P., Lisnaveagh, Baltinglass. Highly commended: Mr. James Waldie's Clydesdale; commended, Mr. Andrew Chalmers' stallion.

Section 3—For the best draught mare, in foal, or with a foal at her feet, or having reared a foal in the year 1855, first prize of ten sovs. to Mr. Sylvester Rait, for a Clydesdale; second of five sovs. to James Kavanagh, Harold's-cross, county Dublin, for a Clydesdale. Highly commended: Miss Morriss's Clydesdale; commended, Thomas Butler's mare.

Section 4—For the best filly foaled in the year 1852, prize of five sovs.—None of sufficient merit.

Section 5—For the best draught filly foaled on or after the 1st of January, 1853, first prize of five sovs. to James Kerr, Lumville, Edenberry, for a Clydesdale; second of three sovs. to James Waldie, Collinstown, Santry, county Dublin. Highly commended: Mr. James Conner's filly; commended, Mr. Edward B. Swift's filly.

Section 6—For the best draft filly, foaled on or after the 1st of January, 1854, first prize of five sovs. to James Kavanagh, Rathland, Harold's-cross, county Dublin, for a Clydesdale; second of three sovs. to John Ronaldson, Newcastle, Newtownmountkennedy, for a half bred Clydesdale. Commended: Mr. Alexander St. Leger M'Mahon's filly.

SHEEP.

JUDGES—Samuel Garnett, Archall, County Meath.
Thomas Laurie.
William Parker, Yanwath Hall, Cumberland.

CLASS D—LEICESTERS.

Section 1—For the best shearling ram, first prize of fifteen sovs. to Rowland Campion; second of five sovs. to Rowland Campion. Commended: Another of Mr. Campion's rams.

Section 2—For the best two shear, first prize of ten sovs. to R. Campion; second of five sovs. to R. Campion. Commended: Another of Mr. Campion's rams.

Section 4—For the best pen of five shearling ewes, first prize of ten sovs. to Frederick F. Hamilton, Windmill Farm, Edenderry; second of five sovs. to William Owen, Blesinton.

Section 5—For the best pen of five ewes, not exceeding five years old, first prize of ten sovs. to Frederick F. Hamilton; second of five sovs. to James Douglas, Athelstaneford, Drem, Scotland. Commended: Another pen of Mr. Hamilton's ewes.

Section 6—For the best pen of five ewe lambs, the prize of five sovs. to Frederick F. Hamilton.

CLASS E—OTHER LONG-WOOL SHEEP.

(Not qualified to compete as Leicesters.)

Section 1—For the best shearling ram, first prize of ten sovs., also Medal for the best ram in the yard, to Sylvester Rait; second of five sovs. to Silvester Rait.

Section 2—For the best two shear ram, first prize of eight sovs. to David Kerr, Clonin, Edenderry; second of four sovs. to David Kerr.

Section 3—For the best ram of any other age, not exceeding six years old, first prize of eight sovs. to Joseph Long, St. Peter's, Guernsey; second of four sovs. to Sylvester Rait.

Section 4—For the best pen of five shearling ewes, first prize of six sovs. to Thomas Beale Brown, Cappawhite, Tipperary; second of three sovs. to David Kerr.

Section 5—For the best pen of five ewes, not exceeding five years old, first prize of six sovs. to David Kerr; and the second of three sovs., to David Kerr.

Section 6—For the best pen of five ewe lambs, the prize of four sovs. to N. W. Roche, M.D., Fermoy, county Cork.

CLASS F—CHEVIOTS OR ANY OTHER MOUNTAIN BREEDS.

Section 1—For the best ram of any age, not exceeding five years old, first prize of eight sovs.; and the second prize of four sovs., to the Marquis of Conyngham, of Slane Castle.

Section 2—For the best pen of five shearling ewes, first prize of five sovs.; and the second prize of three sovs., to the Marquis of Conyngham. No competition.

Section 3—For the best pen of five ewes, not exceeding five years old, first prize of three sovs.; and the second of three sovs., to the Marquis of Conyngham.

CLASS G—SOUTHDOWNS.

Section 1—For the best shearling ram, the prize of 5 sovs. to Thomas Roberts, Strokestown.

Section 2—For the best ram of any other age, not exceeding five years, the prize of five sovs. to Gustavas W. Lambert, Beaupark, Slane. Commended: Mr. Wm. Owen's ram.

Section 3—For the best pen of five shearling ewes, the prize of four sovs. to Thomas Roberts.

Section 4—For the best pen of five ewes, not exceeding five years old, the prize of five sovs. to Joseph Long, St. Peter's Guernsey.

CLASS H—SWINE.

JUDGES—S. Garnett.
Isaac Scott, Edinburgh.
William Parker.

Section 1—For the best boar under eighteen months old, the prize of ten sovs. to Mr. Brogan, Albert Model Farm, Glasnevin; second of five sovs. to Henry Flood, Viewmount, Bagnalstown.

Section 2—For the best boar over eighteen months, and under thirty-six months old, first prize of eight sovs. to John H. Peart, Bellurgan Park, Ballymascanlon; second of four sovs. to Thomas Rutherford, Mooretown House, Ardee.

Section 3—For the best boar in the above sections, the medal. No entry.

Section 4—For the best breeding sow, under eighteen months old, first prize of eight sovs. to C. Metge, Sion, Navan; second of four sovs. to M. Brogan, Albert Model Farm, Glasnevin.

Section 5—For the best breeding sow, over eight months old, first prize of five sovs. to the Rev. J. Warburton, Kill, Naas; the second of three sovs. to the Rev. J. Warburten.

Section 6—For the best lot of three breeding sow pigs of the same litter, not more than ten months old, first prize of five sovs. to James L. W. Napier, jun., Loughcrew; the second of three sovs. to the Earl of Clancarty.

IMPLEMENTS.

JUDGES—John G. Adair, Bellagrine, Ireland.
John Hannam, Wetherby, Yorkshire.
Robert C. Wade, Clonebrany, Ireland.
James Stirling, Edinburgh, Consulting Engineer.

CLASS N.

For the best plough for general purposes, the prize of £5—

J. and F. Howard, Bedford. Highly commended: Ransomes and Sims, Ipswich, and D. Miller. Commended: W. Graham.

For the best plough adapted for deep ploughing, the prize of £5—Ransomes and Sims. Highly commended: J. and F. Howard.

For the best double mould board plough, £5—D. Miller, Dunbar.

For the best instrument for breaking up the subsoil, £5—R. Gray, Belfast.

For the best heavy harrow, £3—J. and F. Howard.

For the best light harrow, £3—J. and F. Howard.

For the best grubber for four horses, £5—Mr. Coleman.

For the best grubber for two horses, £5—Robert Gray.

For the best drill grubber, £3—Mr. Gray. Highly commended: Mr. Graham.

For the best drill horse-hoe, £2—D. Miller.

For the best corn drill for general purposes, £8—R. Garrett and Son, Leiston Works, Saxmundham.

For the best corn drill for small occupations, £3—Richmond and Chandler, Salford, Manchester.

For the best drill for depositing seed and manure (price not exceeding £10), £8—W. P. Stanley, Peterborough.

For the best turnip drill, £3—Not sufficient merit.

For the best machine for distributing portable manure broadcast, £5—R. Garrett and Son.

For the best liquid manure carriage and distributor, £5—R. Garrett and Son.

For the best machine for sowing grass seeds and clover broadcast, £3—No exhibitor.

For the best reaping machine, £10—Dray and Co., London.

For the best haymaking machine, £5—Smith and Ashby.

For the best horse-rake, £3—Smith and Ashby. Highly commended: J. and F. Howard.

For the best machine for hoeing or spacing turnips, £6—No exhibitor.

For the best farm cart, £5—Smith and Ashby.

For the best portable steam engine for agricultural purposes, £20—Ransomes and Sims.

For the best fixed thrashing machine, not exceeding six-horse power, applicable to steam and water power, with a straw shaker and apparatus for shaking the grain for market, £15—No machine with a drying apparatus exhibited.

For the best thrashing machine not exceeding two-horse power, £10—Ransomes and Sims. Commended: Garrett and Son.

For the best machine for winnowing and dressing corn, £5—Dray and Co.

For the best chaff cutter, £3—Richmond and Chandler.

For the best corn and bean bruiser, £3—Ransomes and Sims. Commended: Richmond and Chandler.

For the best machine for breaking agricultural produce into meal, £5—Ransomes and Sims.

For the best turnip cutter, 3*l.*—Richmond and Chandler.

For the best cake breaker, 2*l.*—Ransomes and Sims, Ipswich.

For the best apparatus for preparing cooked food for agricultural purposes, 8*l.*—W. P. Stanley, Peterborough.

For the best set of hand implements used for the farm, 2*l.*—E. M. Spong, Carlow.

For the best set of drainage tools, 2*l.*—John Edmundson and Co., Dame-street, Dublin.

For the best assortment of drainage tiles.—No exhibitor.

For the best churn, 5*l.*—Henry Sheridan and Co., Bridge-foot-street, Dublin.

For the best and most economical set of farm harness, 3*l.*—Not sufficient merit.

For the best drainage level not exceeding 2*l.* in price, 2*l.*—No exhibitor.

SPECIAL AWARDS.

Commended: R. Garrett and Son for turnip and manure drill; W. P. Stanley for Bentall's broad share; Smith and Ashby for Cambridge roller; Richmond and Chandler for thrashing machine. Highly commended: Richmond and Chandler, for root washer; F. M. Spong for collections of seeds and grasses.

DAIRY PRODUCE, FLAX, &c.

JUDGES—M. De Cockhenefer, Belgium Agriculturist.
James M'Donald, Carlow.

CLASS L—DAIRY PRODUCE.

For the best firkin of butter, 70lb. weight, suited for the English or London market, and made on the farm of the exhibitor during the season of 1855, first prize of £5 to Michael Nolan, Oldcourt, Kilmeaden, county Waterford; second of £3 to Montgomery Robins, Kyle, Kinnetty.

For the best firkin of butter, 70lbs. weight, suited for the foreign market, and made on the farm of the exhibitor during the season of 1855, first prize of £5 to Stephen Moore, Barne, Clonmel; second of £3 to Edward Smith, Knore, Bandon; third of £2 to John Gough, Olderig, Carlow. Best of all the prize butter, the medal to Michael Nolan, Oldcourt, Kilmadon, county Waterford.

For the best couple of new milk cheeses made in Ireland, of the season of 1855, in imitation of any known and approved description of English cheese, not less than 20lb. weight, first prize of £5 to Henry Webster, Ballykeenan, Myshall; second of £2 (no competition).

CLASS M—FLAX.

Section 1—For the best bundle, not less than 16lb. weight, of mill scutched flax, being an average sample of the produce of at least half an acre, first prize of £3 to David Patten, Dogheys, Glasslough; second of £2 to Edward Smith, Knore, Bandon.

Section 2—For the best bundle, not less than 16lb. weight, of hand-scutched flax, being an average sample of the produce of at least half an acre, first prize of £3 to David Patten; second of £2 to Edward Smith.

Section 3—For the best bushel of flaxseed, saved by the growers, first prize of £3 to David Patten; second of £2 to John Boyle, White Beek Flax Mill, Leeds, Yorkshire.

Section 4—For the best six hanks of hand-spun yarn, first prize of £1 to William Ager, Tullow-street, Carlow; second of 10s. (no competition).

THE DINNER

took place on Wednesday evening, August 8, the Duke of Leinster, as President of the Society, in the chair, supported by his Excellency the Lord Lieutenant, Lord Monck, the Earl of Clancarty, the Marquis of Kildare, Lord Gough, Lord Dunloe, Lord Lurgan, Lord Cloncurry, Lord St. Lawrence; Sir James Stronge; Rev. Sir Hunt Johnston, Bart.; Capt. W. B. M'Clintock Bunbury, M.P.; Mr. W. Fitzwilliam Burton, of Burton Hall; Sir Edward M'Donnell; Colonel Bunbury; Lieut.-Colonel Sir Thomas Butler, Bart.; Sir Robert Ball; the Dean of the Chapel Royal; the Hon. St. John Butler, High Sheriff of the County Dublin; Mr. J. Hans Hamilton, M.P.; Hon. Captain Gough; Hon. S. Daly; Mr. J. Alexander, M.P.; Sir James Dombrain, Lieut.-Colonel Keogh, Colonel La Touche, and a very strong muster of country gentlemen and agriculturists.

The customary loyal toasts having been duly given and honoured, the Chairman proposed "The Lord Lieutenant, and Prosperity to Ireland."

In answer, his Excellency said: My Lord Duke, my Lords and Gentlemen, I beg to return you my sincere thanks for the distinction you have been pleased to confer upon me, in coupling my name with a wish so near to all your own hearts as that of "Prosperity to Ireland." It is an honour that I am fully sensible is due to the position which I have been appointed to fill, but which you will allow me to say, is very largely enchanced by the cordial manner in which it has, on this occasion, been conferred. I am not, by any means, a stranger to agriculture, on a large scale, in my own country of England; but this is the first time I have had the opportunity of assisting at the annual gathering of the Royal Agricultural Improvement Society in the provinces of Ireland. I believe that this society entered upon its career—its most important and auspicious career—at the period when my first official connection with this country came to a close; but not before I had the opportunity of conferring upon the subject with one whom you will all admit to have been one of its most public-spirited and efficient promoters, if

I may not call him entirely its founder—I mean the late Mr. Peter Purcell. To prove how far it has since proceeded and prospered, I have only to refer to the large dimensions, the excellent arrangements, the quantity and the quality that have been this day displayed upon the verdant banks of the Barrow. Since the period to which I have referred—the period of its first birth—allow me to cast a brief retrospective glance upon its prominent operations in the subsequent interval. This society wisely resolved to encourage affiliated societies, and I learn that there are, at this moment, upwards of seventy such branch societies established in Ireland. By this method, and by holding its annual meetings in the principal towns of Ireland in succession, it has carried its own experience through every district, each in its turn, and has thereby tended to fuse together the knowledge of the best specialities of each, whether in tillage or in pasture, in cereals or in green crops, or in the breeding and fattening of cattle; and I have little doubt that, without slighting other most weighty influences which have been at work upon the social condition of the Irish people—some of them of a mingled character—without slighting the due weight to be attached to these influences, I have little doubt that the Royal Agricultural Improvement Society of Ireland has greatly assisted the extension and improvement of agriculture which has so largely marked the last twenty years in the annals of your country. For example, let me just mention that I find, by the late official returns, that the quantity of land under cultivation in Ireland in 1841 was 13,564,300 acres; in the year 1851 it had amounted to 14,802, 581 acres; and then, as to the value of live stock, it was in 1841 computed to be £19,399,600, and in 1851 it had reached the figure of £27,326,000 (cheers); in 1853 it had further increased to £31,844,000, and in the last year, 1854, it is computed to have reached £33,508,000. But observe, this does not give even the quite accurate measure of increase; because, for the sake of forming a comparison, the same prices were affixed to the relative number of cattle in each of the two periods, whereas I take it, the true increase has been in the better description of stock, and that, as the quality has improved still more than the quantity, we may assume, without fear of exaggeration, that the value of the live stock of Ireland now may, at least, be put at double the amount that it was worth when your society began its career. Again, one of the most important operations of this society must have been to make it manifest for what species of production the soil and climate of Ireland were most suited, and for what species of production the different parts of Ireland itself were most suited (Hear, hear). I believe, of late years, it will be found that the growth of wheat has diminished, but that of oats and barley has increased; but the increase is still more striking with respect to green crops—turnips and mangel-wurzel; for I believe it is true that there is now, in 1855, an acre of green crops to every two acres of corn crops; while, no longer ago than 1847, the proportion of green crops was one acre to four and upwards of corn crops. Then, with respect to one of the agricultural productions, and a very important one it is—the flax crop—for which the climate and soil of Ireland have been thought particularly suited, and to the growth of which the present war with Russia has given great additional importance. Now, the flax crops, in 1849, occupied 6,314 acres; but in the year 1853 they occupied 174,379 acres. Chiefly, I believe, the amount of flax grown is confined to the north of Ireland; but there are not wanting now many enlightened proprietors in the west and south to make the experiment, and I have no doubt that, if it be found remunerative—which, I beg to remind you, is the sure and sound test of every production—if this be the case, I have no doubt their patriotic example will be largely followed. But the crop of flax is too bulky in proportion to the fibre to bear the cost of carriage, without the aid of scutch-mills. I find that the scutch-mills, last year, amounted to 1,100. Therefore, there is every reason to believe that this important article of produce is being largely cultivated. Then, you must not forget that, while the productions of Ireland have increased, that it is true, to some extent, that your population has diminished (Hear, hear). Therefore, the condition of the remaining portion of the population, I take it, has been benefitted in two ways; and, so far as their means of command over the necessaries of life and the chief articles of sustenance are concerned, not only has the amount of food at their command been increased; but there has been, also, a marked improvement in the soundness and nutritive character of that food. Then, my lords and gentlemen, if such has been the continued progress, despite the blight of famine, the drain of emigration, and the more frightful calamity of war, altogether, whether we refer to the productiveness of the soil, the enterprise of the proprietors, or the general condition of the people, may not our hopes for the future—sobered, indeed, by reliance upon the inscrutable will of an all-ruling Providence—but may not our hopes for the future be most encouraging and sanguine? If such is the general improvement in Irish agriculture, and the social condition of the Irish people, let me add my earnest hope that this society—the Royal Irish Agricultural Society itself—may long continue to witness and to develop those inestimable advantages under the honoured auspices of your grace; and that gathering still increasing support from all classes, and all orders—from those who represent the most ancient lineage and the largest wealth of the country—from those whose hard working and honesty industry and labour support the wide basis of our social fabric, borrowing all new lights from science, applying all such new methods, and perfecting all such old ones as experience may approve—this society may long continue to work each future year, as it has done each past year of its valuable existence, and find its best reward in the acknowledgments of new advantages conferred upon a peaceful, a prosperous, and a grateful people.

His Excellency then gave "The Health of the President," and the Duke of Leinster having briefly acknowledged the compliment, proceeded to "The Memory of the late Mr. Peter Purcell."

Lord Monck next gave "The Army and Navy."—Responded to by Lord Gough and Captain Bunbury, M.P.

Lord Clancarty, in replying to "Prosperity to the Royal Agricultural Improvement Society of Ireland," said: We feel that this society is formed for one great and important end, and I can only say for those upon whom the business devolved, that they have endeavoured to keep steadily in view that great end, without allowing themselves to be turned to the right hand or to the left, and persons of all grades in the country have united, and, by keeping one common object in view, they have acted unitedly for the advancement of the agricultural interests of the country. The principles of the society are unexceptionably sound. No doubt an infant society—as ours may still be called—is somewhat imperfect in its details; but we have adopted our rules so as to meet the necessities of the country and to render the society as perfect as possible. Our success—we cannot speak of our great success, but we have had success quite sufficient to compensate for much anxiety, perseverance, and labour, and to stimulate us in our exertions—our success has been spoken of by his Excellency to-day, in the able speech which he has addressed to us; he had, very justly and fairly, placed to the credit of this society the great

degree of agricultural improvement that has taken place since 1841. No doubt a great amount of improvement has taken place that has not been immediately the result of any act of this society; but if encouragement, by legislative acts and other sources, had been given, I will say that it is owing to the fact that agricultural improvement had been set on foot by this society that has led to such results. But the improvement in stock, which is more remarkable still, is immediately referable to this society (cheers). It is by the inducements that we have held out to our English and Scotch friends that we have succeeded in bringing a pure breed of stock to our markets, that we have it now on the small farms of our peasantry. We cannot certainly boast of that support that is received by the Royal Agricultural Society of England, upon the principles of which ours is founded; we do not envy our neighbour in England, but the contrary, though it is in the enjoyment of much larger resources, under the influence of royal patronage; but it has an effect on the community at large, in the example it sets to us—that a country like England, so favoured and so wealthy as it is, thinks that there is still room for improvement. We see in the example, then, of the English society a stimulus to ourselves; we read its proceedings with great interest, as containing instruction for ourselves; and if we have not, as we certainly should derive a large amount of support from the proprietors of the soil, we still, I am happy to say, have an increasing support, though still far from the measure to which the society is entitled. We also derive great benefit from the annual gatherings held in the provincial towns of England; we find exhibited at our shows, stock that had been exhibited at the English shows; and our great desire is, when they come to this country, that we should retain the stock, and thereby improve our blood. We endeavour to do that, and to a great extent we have done it. I cannot say on this occasion that we have done so, for I regret to say that none of the prize bulls exhibited at Carlisle were here to-day; but if Carlisle has failed to give us cattle in our show-yard, I must say there is one bearing that honoured name — that ancient title—amongst them, whose influence would benefit the society, and the country generally. The noble earl had expressed the interest that he feels in the agricultural improvement of this country; he has shown you how he has compared the returns, and I wish he would come to our great annual mart in Ballinasloe, and witness those practical results of which he had been speaking, in the improvement of stock. I can assure the noble earl that he will receive no less a warm reception there than he has received here. The noble earl on resuming his seat was warmly applauded.

Lord Cloncurry called upon them to drink "The Royal Agricultural Society of England and the Highland Society of Scotland." He did so with great pleasure, for there were no societies more deserving of their approbation. The Royal Agricultural Society of England was a great institution, and they had the benefit of some of the great results flowing from it, in the number of implements in the show-yard that day, which, but for the liberality of that society, would never perhaps be called into existence. But, perhaps, the Highland Society of Scotland had higher claims on their regard, because it was the parent of their own. It was the advantages arising from it that suggested to Peter Purcell the idea of securing for his native land similar results by establishing this society. They had every reason to be proud of the benefits which had accrued to agricultural interests from those meetings of this society. They were now within a few miles of a district (Ballytore) which was the first to form a local agricultural society; and he ventured to say that there were thousands of pounds annually circulated in that district, which would not be the case but for the practical benefits derived from that association.

Mr. Hannam returned thanks on behalf of the Royal Agricultural Society of England. He said that it had fallen to his lot, some three years ago, to be a judge of agricultural machinery for the Irish society. It was his good fortune to act in a similar capacity at this show, and he could verify the statements which had been already made of the great improvement which had taken place in that department. It was such as to astonish some of the best makers of the southern districts of England. When they attended, on the first occasion, the meetings of this society, their highly-finished efforts were not appreciated; but they now found purchasers in Irish farmers who were capable of understanding the value of the machinery they had brought to such perfection. He believed there was a paucity of English stock in the yard that day, but that did not arise from any want of interest in the show on the part of English breeders. It arose from the fact that the meeting of the Yorkshire Society was held only a few days since at Malton; and when they recollected that they had taken from that society its president (Lord Carlisle), they would not blame Yorkshiremen if they did not suffer them to deprive their show-yard of its other attractions. The spirit of improvement which was developing itself in Ireland, a practical farmer visiting the country even for a few days, could not fail to notice. Implements previously thought too costly and cumbersome were being introduced. Again, he could see increased attention paid to sheep-breeding. He would, however, offer one suggestion respecting the horses. He admitted the splendid blood Ireland contained, but for the purposes of agriculture we wanted more bone and substance (cries of "Hear, hear"). The horses which graced the Curragh, and showed on the Downs of Epsom, did not seem suited for the plough.

Mr. Sterling replied for the Highland Society of Scotland.

Captain Ball then proposed "The Promoters of the late Agricultural Exhibition in Paris, and Prosperity to French Agriculture," in a speech of great length, which was but imperfectly heard. He said, however—amongst much other matter—I was prepared to find that the show in Paris would, in many respects, prove inferior to anything we should expect in this country. In this I was agreeably disappointed; for in many of the arrangements and matters of detail for which the French are so celebrated, we might learn a profitable lesson. If the show of beasts were deficient in number, there were some animals of good quality, and I feel great gratification myself in being one of the successful competitors; but the fact that gave me the greatest pleasure was the exhibition of European breeds that were brought to that show; for there was an exhibition of all the breeds in Europe, Russia alone excepted; and there were some practical matters which I carried away with me, and which I may be allowed to mention. Though I did not see in the French breeds those fine points which we witnessed in our show-yard to-day, especially that early maturity which we are given to suppose is the principal standard of perfection, still we found many very useful breeds for the dairy. We found that the Southdown sheep were in the highest possible estimation, and that the short-horn was greatly valued. But if we found the French breeds inferior in that which we consider to excel, there was one point in which they excelled—purity of breed. Every class represented itself, which shows the very great care and anxiety with which the French breeders attended to the purity of their stock.

The Marquis of Kildare proposed, and Mr. Wade answered for "The Judges;" and Captain Gough intro-

duced "The Local Committee," to which Mr. Rochfort replied.

Mr. Clayton Browne then gave "The Railway and Steamboat Companies," in responding to which Sir E. M'Donnell said: When they first opened a railway to that locality, they were looked upon as men who would monopolise the whole trade of the country, and put high tariffs on agricultural produce; but now the only communication they received was that they were not sufficiently supplied with trucks to carry their cattle. The great commercial interests of the country were connected with the agricultural interests, so that they were only benefitting themselves in assisting them. With respect to the results, what were the facts of the case? They carried in 1847, 8,000 oxen; in 1854, 49,000 (hear). They would say that the line was opened in 1847, but in 1849, when it was opened to Cork, they carried 24,000. If they look to sheep, the increase was extraordinary. The same might be said of pigs, the number being 26,000 to 195,000 for the same time. With respect to calves, the number in 1847 was 1,000; in 1854 it was 7,000, showing the imports which had taken place for the improvement of the breed. The only thing they had been able to do for them on the present occasion—he was sorry they were not able to do much—was to place the great room at their disposal, which, through the exertions of the committee, had been transformed from a locomotive house to a splendid banqueting hall (cheers). This was the only thing they had done for the Agricultural Society; but each and every year, as it progressed, they would find the different companies contending as to who would have them.

FARMING COMPETITION AT STANWICK PARK, NORTH YORKSHIRE.

The fine farming district for several miles around Stanwick Park, in the North Riding of Yorkshire, the beautiful seat of His Grace the Duke of Northumberland, was the centre of unwonted interest and excitement on Monday and Tuesday, August 21 and 22, on the occasion of the survey and award of the judges appointed to decide upon the best-managed farms, within the district mentioned, entered for competition for premiums given by His Grace the Duke of Northumberland. The present prizes have been the first offered on the condition that the superior agricultural management and fertility necessary to secure them shall extend, more or less, to the entire farm. His Grace could not have perhaps selected any part of his extensive property more eligible than that which forms the centre of the beautiful and fertile district included in the competition. The Stanwick Estate comprehends a number of fertile and excellent farms, contiguous to them being other estates owned by various extensive proprietors or smaller freeholders, the farms on which also are for the most part of moderate limits. To these, as well as to the tenants of His Grace, the competition was open; and to all of them, about twelve months ago, after communication with the neighbouring proprietors, the following circular was issued, which, as stating the prizes, and the extent and conditions of the competition, we subjoin:—

"PRIZES FOR THE BEST-MANAGED FARMS, GIVEN BY HIS GRACE THE DUKE OF NORTHUMBERLAND.

"£30 for a Farm exceeding 200 acres; £15 for a Farm not exceeding 200 acres, but more than 20 acres. The above prizes are open for competition to all Tenant Farmers residing in the townships of Stanwick, Aldbrough, Melsonby, Gayles, Dalton, Forcett, Eppleby, East and West Layton, Caldwell, Barforth, Cliffe, Manfield, and to all tenants of the Duke of Northumberland in Yorkshire. The award will be given for Good Cultivation, State of Fences, Gates, Roads, Water-courses, Buildings (as far as depend on tenants), Live Stock, Implements, Best-kept Accounts, Use of Artificial Manure, or the contrary, and everything connected with good Husbandry, and will be adjudged by three competent judges, when the crops are near maturity, but before cutting has commenced, probably in the month of August, 1855. Competitors must signify their intention to compete on or before the 13th of May, 1855, addressed to the Agent of the Duke of Northumberland, Stanwick, Darlington. Prizes under these conditions will be given for three years, namely, in 1855, 1856, and 1857. The successful competitor will not be entitled to gain a prize in two consecutive years."

The judges were Mr. Josh. Snowball, Netherwitton, near Morpeth, agent for the Earl of Eldon, Mr. Baker Cresswell, and others; Mr. Edward Lawson, Redesdale Cottage, agent for Lord Redesdale; and Mr. Robt. Jas. Wyley, agent for the Duke of Leeds, Hornby Castle, near Catterick. There were six competitors, four for the first prize and two for the second, whom we shall place in the order in which they were visited:—

FOR THE FIFTEEN POUND PRIZE.

1. Mr. Geo. Bowes, Layton Moore, tenant of Edw. Kemp Esq., Layton Hall.
2. Mr. Robert Eeles, Foxberry, tenant of the Earl of Brownlow.

FOR THE THIRTY POUND PRIZE.

3. Mr. Richd. Kay, Forcett Valley Farm, tenant of John Michell, Esq., Forcett Hall.
4. Mr. Clark, Aldbrough, tenant of the Duke of Northumberland.
5. Mr. John Wood, Stanwick Park, tenant of His Grace.
6. Mr. Thomas Wetherell, Kirkbridge, tenant of His Grace.

The following is the award of the judges:—

"We, having been appointed to award the prizes given by his Grace the Duke of Northumberland of £30 and £15 for the best cultivated farms, within the townships of Stanwick, Aldbrough, Melsonby, Gayles, Dalton, Forcett, Eppleby, East and West Layton, Caldwell, Barforth, Cliffe, Manfield, and including all tenants of his Grace in Yorkshire, hereby award to Mr. Thomas Wetherell, of Kirkbridge, tenant of the Duke of Northumberland, thirty pounds, being the sum to be awarded for the best-cultivated farm exceeding 200 acres, and to Mr. Robert Eeles, of the farm of Foxberry, tenant of the Earl of Brownlow, fifteen pounds, being the sum to be awarded for the best-cultivated farm not exceeding 200 acres, these premiums being awarded with reference to the cultivation of the farm, the state of the roads, fences and gates, water, courses, buildings, live stock, implements, best-kept accounts-the use of artificial manure, and including everything connected with good husbandry. In making this award we cannot help alluding to the satisfaction we felt in viewing the farm of Forcett Valley, in the occupation of Mr. Richard Kay, the tenant of John Michell, Esq, of Forcett Hall, he having evidently for some years past adopted the most spirited and energetic means for the improvement of his farm, which has every appearance of soon being raised to the highest state of cultivation—the tenant in these improvements appearing to have been met by the landlord in the most liberal manner.

"Dated this seventh day of August, 1855.

"JOSH. SNOWBALL.
"EDW. LAWSON.
"ROBERT JAMES WYLEY."

WARBLES AFFECTING CATTLE, AND PRODUCING DEATH.

SIR,—Professional duties would not permit my fulfilling my promise earlier on the subject of the Œstrus Bovis, Breeze or Gad Fly, or as the Chinese have the term, "The fly which drives the cattle mad." Some of your readers may be in possession of similar instances as these I now relate, as to the ill effects produced upon cattle by this waspish tormenter, whose sting is as much dreaded by animals, as a nest of hornets or the keenness of the Tabanus or Horse Fly is to the human race, which pierces the skin so fiercely as to let blood instantly, occasioning an intolerable smarting; yet in no comparison is the painful result to that produced upon cattle which are exposed to the torture of the Bovis under a burning summer's sun, when fly and beast are equally excited. Excess of irritation is left behind after once having wounded the sensitive skin, which is not to be slightly regarded as a mere painful sting, but has by its infliction left a deposit, *an egg*, which, at

the painful expense of incubation of a parasite, must of necessity give rise to more or less inflammatory action, before it can be matured. The following cases will give some little idea of the extreme sufferings these unfortunate animals have to undergo during the process of the egg's incubation up to reaching its chrysalis state, which is then so far complete as regards the torture upon the animal. It has now finished its growth, and escapes from its cell shortly afterwards, to do the work of its parent fly. From my case book, I extract the following instances of fatality:—When I was called upon by W. G. Hodgkinson, Esq., then of Park-hill, near Worksop, to two fine female calves, from nine to eleven months old, which were dead, and several others of the same ages affected, the owner had formed an opinion that the disease was one of fatal character to all, namely, Black Leg, Black Quarter, or, as others term it, Speed—very indefinite terms of another fearful and fatal malady, which in a future paper I may touch upon, and unless investigation had been thoroughly gone into, the fell monster Black Leg would have been unjustly charged with these deaths. I may here, digressing a little from my subject, state that the examination of animals as to the cause of death is too carelessly neglected; and while this remains the case, the owners of cattle must suffer in proportion to such neglect. The *post mortem* examination alone convinced the proprietor of his error: the nature of the disease, and the true cause of death, were developed. The skins, on their removal from the body, presented an appearance as if at a short distance slugs had been fired through them from a musket; the course of the backs and sides of the bodies of the animals at once gave a view of the destructive process. All the blood-vessels were broken up, and the whole presented a dark heavy mass of extravasated blood, the cellular tissue completely infiltrated, and the cells of each warble or grub ran into each other; by a few minutes' exposure, to the air, the blackened surfaces were changed to a dull green colour, always remarkable in changes of structure that are deadened and mortified. The organs of life in the cavities of the chest, as well as the abdominal, were each in a state of perfect health. My next object was their living companions, who also had their full portion of disease and suffering from the vast number of warbles. The treatment I adopted was by small incisions in the skin, directly over where the tenaculum of the fly had been introduced, a solution of a mild caustic nature placed on the point of a skewer, and put therein; whilst scores of others, more matured, an assistant and myself crushed and forced from their habitations, which, with shelter from the heat of the weather, and a little cooling medicine, put all right. Fortunately from this cause, fatal cases are not of very frequent occurrence; but the result of wrong conclusions as to the nature of the disease is quite evident, being charged to the account of a disease widely different, and requiring a treatment distinctly opposite. The inattention to *post mortem* examinations, and the principle by which medicine is administered to animals, seems with many to have no consideration. The latter (medicine) is most shamefully abused, and who ought to have science as her guide, requiring the greatest skill in its administration, is trafficked in, and recklessly poured down the throats of animals by the most ignorant and unwary, who scarcely know the difference of common salt and sawdust, excepting by colour. Under such existing every-day enormities need it be wondered at that cattle die, and such heavy and frequent losses are sustained? Much better would it be for those poor miserable brutes, were they left alone to struggle with their fatal and painful maladies; but much worse is their condition, and scores fall victims annually to the poison forced upon them by persons of the commonest pretensions. In the course of a little time, I will supply cases with my views and treatment of Black Leg, or, more properly, inflammatory fever affecting young stock, and in the mean time shall be most happy to receive any remarks from your various correspondents on the nature and treatment of the diseases of cattle, and *prevention, if any,* of some of their important ailments, such as pleuro-pneumonia, in which I doubt not that by a new principle in the administration of medicine, we have a recognised hope, if not in totally curing, yet of modifying both cause and effect.

I am, sir, with every sincere regard to you and the agriculturist and his interests,

Very obediently yours,

CHARLES SAYLES, Veterinary Surgeon.

Tickhill, Rotherham, July 30, 1855.

AN APPEAL TO IMPLEMENT MAKERS.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR, — Having been a subscriber to the "Farmers' Magazine" for the last fourteen or fifteen years, I venture to take the liberty of asking you to insert these few lines in your next month's publication, in the hope that they meet the eye of some one of your intelligent readers who may be able to give me a wrinkle, or perhaps some valuable information (the result of his own experience, if possible) on the subject mentioned below. I have a good deal of mountainous land, overrun with heath and small furze, or gorse, situate in Pembrokeshire, which has ever been, and still is, of but little profit or value to me, but which, by means of an implement, the nature of which I will endeavour to explain, might, I think, be rendered of considerable profit and value, could I by any possibility get one that would effectually execute the work I assigned to it. The thing I want is a plough or implement to supersede *manual* labour in *effectually paring* the heath and small furze off the mountain land at a depth of about an inch or an inch and a half, and which would have the effect of entirely and completely cutting through the roots obstructing and coming in its way. The only means by which such paring is done in this part of the country, is by the breast-plough—a work of great toil, difficulty, and expense. The land is tolerably free from stones, of which none are of such a size, as to impede a common plough. I have removed the surface, pared and burnt a portion of it, and have raised good maiden crops after adding a small quantity of lime to the ashes, and would no doubt be able to produce good subsequent ones, only use the soil well. I have this season as fine a crop of turnips on a part of it as a man need look upon after wheat, to produce which I put 3 cwt. of superphosphate of lime to the acre. I offered a piece of plate at our last agricultural meeting to the one who could produce an implement of the sort that would effectually do the work, but no attempt was made to claim it, and I fear no competition is ever likely to take place about it in this neighbourhood. I trust this may come under the notice of some one, whether farmer or mechanic, who, as regards the one, has had occasion to use, and as regards the other, might be able to construct such an implement, and should be truly obliged to either or both, and, indeed, to any one, for any remarks and observations they may be good enough to make on the subject. If an implement of this nature could be had (in this part of the country at all events), many a large tract of land now almost valueless might be rendered profitable enough. Apologizing for the length of my letter,

I remain, sir, your obedient servant,

AGRICOLA.

METEOROLOGICAL DIARY.

1855.	Barometer. 8 a.m in. cts	Barometer. 10p.m. in. cts.	Thermometer. Min.	Thermometer. Max.	Thermometer. 10p.m.	Wind and State. Direction.	Wind and State. Force.	Atmosphere. 8 a.m.	Atmosphere. 2 p.m.	Atmosphere. 10p.m.	Weat'r.
July 22	30.16	30.16	56	76	64	Westerly	calm	fine	cloudy	fine	dry
23	30.08	29.85	58	76	63	Variable	calm	fine	cloudy	fine	rain
24	29.74	29.79	61	72	60	S. West	gentle	cloudy	cloudy	cloudy	rain
25	29.70	29.80	56	68	56	S. West	airy	fine	fine	fine	rain
26	29.80	29.80	54	65	58	South	gentle	cloudy	cloudy	cloudy	rain
27	29.81	29.89	56	73	61	S. West	gentle	fine	sun	fine	showery
28	29.91	29.92	57	70	59	W. S. W.	airy	fine	cloudy	cloudy	storm
29	29.94	29.92	54	76	63	W. S. W.	airy	fine	sun	fine	dry
30	29.92	29.86	58	75	62	S. West	gentle	cloudy	fine	cloudy	dry
31	29.90	29.93	58	71	57	S. West	brisk	cloudy	fine	fine	showery
Aug. 1	29.86	29.86	54	71	63	S. West	lively	fine	sun	fine	dry
2	29.86	29.82	58	73	60	S. West	strong	fine	sun	fine	showery
3	29.82	29.72	56	73	59	S. S. W.	brisk	fine	sun	fine	dry
4	29.72	29.80	56	70	60	Westerly	brisk	fine	sun	fine	showery
5	29.97	30.08	56	73	58	W. by N.	gentle	fine	sun	fine	dry
6	30.08	29.98	50	74	61	S. by E.	gentle	fine	cloudy	cloudy	showery
7	29.82	29.75	59	74	60	S. var.	var.	cloudy	fine	cloudy	showery
8	29.70	29.74	57	72	56	Westerly	var.	cloudy	cloudy	cloudy	showery
9	29.87	29.95	47	74	60	Westerly	gentle	cloudy	fine	cloudy	dry
10	30.01	30.17	48	74	62	W. by N.	gentle	fine	sun	fine	dry
11	30.22	30.23	58	74	65	W. by N.	v. calm	cloudy	cloudy	fine	dry
12	30.22	30.22	62	72	58	N. West	airy	cloudy	cloudy	fine	dry
13	30.24	30.24	52	74	56	North	gentle	fine	sun	fine	dry
14	30.23	30.22	50	75	64	N. W.	gentle	fine	sun	cloudy	dry
15	30.25	30.25	59	73	62	N. W.	gentle	fine	sun	clear	dry
16	30.30	30.30	55	75	64	North	airy	fine	sun	fine	dry
17	30.31	30.25	54	77	66	Variable	calm	fine	sun	fine	dry
18	30.22	29.90	56	75	69	S. East	lively	fine	sun	cloudy	dry
19	29.78	29.84	64	74	62	W. S. W.	lively	fine	sun	cloudy	dry
20	29.86	29.86	59	67	61	W. S. W.	strong	cloudy	cloudy	cloudy	drops

Estimated Averages of August.

Barometer. Highest	Barometer. Lowest.	Thermometer. High.	Thermometer. Low.	Thermometer. Mean.
30.26	29.35	82	41	61.6

Real Average Temperature of the Period.

Highest.	Lowest.	Mean.
72.8	55.9	60.966

Weather and Phenomena.

July 22.—Circo-stratus, or mackerel clouds. 23.—Thunder-storm, setting up of excessive rains that fell through the week. 29 and 30.—Fine maturing days. 31.—Much cooler: rainy over night.

Lunation.—Full Moon, 29th day, 6 h. 20 m. morning.

August 1.—Fine Summer-day; Cirrus. 2.—Showers. Singular yellow suffusion in west at sunset. 3.—Solar halo; fine day; clouding at night. 4.—Beautiful and airy; lull and a shower. 5.—Fine day; rich sunset. 6.—Close. 7.—Fine; then showery. 8.—Heavy showers; thunder. 9.—Fine. 10.—Forcing day. 11.—Close and clear day. 12.—Heavy masses of clouds. 13 to 18.—Generally fine harvest weather. 19.—Brilliant morning, but change of wind. 20.—Strong wind and rising clouds indicate a struggle.

Lunations.—Last quarter, 4th day, 9 h. 21 m. P.M. New moon, 12th day, 6 h. 52 m. P.M. First quarter, 20th day, 8 h. 34 m. P.M.

Remarks connected with Agriculture.—This has been an anxious period; for, after the more than 6 inches of rain which fell in July, 7 cents. more were registered in the first eight days of August. However, the thunder-storm of the 8th proved critical, and glorious weather was established: harvesting commenced speedily, and has been carried on rapidly. The cereals are certainly fine; the grass and fodder crops and roots vastly improved by the rains; and potatoes, though partially affected, promise to be sound at root, and in great abundance.

J. Towers.

Croydon, Aug. 21.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR AUGUST.

Considering the extreme fineness of the weather, the progress of harvest-work during the month has been comparatively slow. Some large quantities of wheat have been cut and carried in good condition; but an immense extent of country, even in the forward counties, has yet to be cleared of its produce. From the numerous contradictory statements which have come to hand respecting the yield of the crop of wheat, it would appear almost impossible to form a correct estimate of the growth. We are perfectly aware that many of the reports require more than ordinary caution in dealing with them; yet we may observe that, taken in the aggregate, they prove that the produce upon the light soils is decidedly less than in 1854. To counterbalance this deficiency, the heavy lands have *more* than an average growth, and we have a great increase in the extent of land under wheat culture. In order to ascertain by personal inspection the probable produce of the crops generally, we have made an extensive tour in most of the leading grain counties; and we confess that the result of our inspection has established the all-important fact, that we have had more land sown with wheat this year than we ever remember. This feature must, in our judgment, more than counterbalance any falling off in the yield upon light soils: hence, we see no reason to alter the opinion we expressed in our last report, that the total produce is an average one. Of course, much remains to be done ere the crop is secured; much labour—which appears to be unusually scarce in some counties—has yet to be expended; and the condition of the wheats may be materially affected by unfavourable weather: but, assuming that we shall have a favourable temperature, and that the crop will be stacked in good condition, we have no fear of the general result of the harvest as to quantity. As regards the yield of barley, it is admitted on all hands that it is rather above an average; but the heavy rains which fell towards the latter end of the past and the commencement of this month have caused a great deficiency of colour: consequently, the crop will not prove a valuable one. The yield of oats, beans, and peas is somewhat in excess of last season; but the extent of land sown with those articles has been much smaller than in the ordinary run of years.

Of course, much anxiety is manifested by the growers to understand their position as to the future: in other words, the question of price has entered largely into their calculations. The non-practical observer appears to have run away with the belief that because we have grown an average quantity of wheat we are to have a considerable reduction in prices. This is a great fallacy, as, no doubt, results will show. An average supply of home produce will never have the effect of keeping the value of wheat low in this country; and quotations will invariably be governed by the extent of our importations from abroad; and when we calmly consider the probability of our receiving over-abundant supplies of foreign grain, we confess that we are at a loss to understand many of he statements on that head which have made theirt appearance in some publications. We must not forget that we are still engaged in a great struggle with the largest corn-producing country in the world—viz., Russia; that, as the war is likely to last for some time, there is no possibility of our receiving any extensive supplies from thence this year; and further, that the arrivals from the Lower Baltic ports will shortly be on a limited scale. Let us add to these features in the trade the fact that we have commenced the consumption of the new crop with a very small supply of old wheat on hand; and that, as prices have not fallen sufficiently low to admit of profitable shipments, we shall receive a very moderate supply of wheat and flour from the United States till quite the end of the year. The home-grower—though he has already commenced thrashing out—will hardly force the markets with large supplies; indeed, from the great demand for labour for other purposes than thrashing, we do not expect what may be termed heavy arrivals for a considerable period. Low prices are, therefore, in our opinion, wholly out of the question, because they would not be warranted by circumstances.

In some quarters, the turnip and beet crops are looking well and promising; but in others they exhibit but a poor return. The fineness of the weather has had a most beneficial influence upon the pastures, and we anticipate a good second-cut of hay. The first cut was, perhaps, the smallest on record; consequently, both old and new hay has been selling at extravagantly high rates—prime meadow having realized £6 12s. and £6 15s., and very fine clover £7 per load. These are the highest quotations recorded for many years past; but it is quite evident that very little reduction will

take place in prices, notwithstanding that there is every prospect of a comparatively large second-cut.

The advices respecting the potato crop are less conflicting than for some past seasons. In most quarters, the growth is a most luxuriant one; very few traces of disease have been met with, and the supplies forwarded for sale have been immense. In the event of the disease not spreading, much influence will be exercised upon the value of the better kinds of food, more especially as the extent of land under potato culture is unusually large.

Since the close of the public sales, the wool trade has been in a very depressed state, and the quotations have ruled almost nominal. The stocks everywhere appear to be large, and to effect extensive transactions lower prices must be submitted to.

The growth of most seeds appears to have been good as to quantity, but somewhat deficient in quality. On the whole, the trade has ruled steady, and prices have been well supported. The sale for linseed has continued rather brisk, at full quotations; whilst the imports of that article from India have been on a very liberal scale. The war with Russia has, as yet, been of immense advantage to the growers of linseed and rapeseed in our Indian territory, who are in a position to supply us with unlimited quantities. Cakes have sold to a fair extent, considering the increased supply of green food, and the quotations have kept up remarkably well.

In Ireland and Scotland harvest work has made fair progress, and shipments of new oats and oatmeal have already been made from the former country to England. Generally speaking, the corn trade has been inactive, without, however, producing any marked change in the quotations. The stocks of old grain appear to be greatly reduced.

The cattle trade—arising from the very moderate supplies of English stock on offer—has been very firm, and the quotations have ruled high. It is scarcely possible, looking to the enormous consumption going on, that any great decline can take place in prices.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The metropolitan as well as the large provincial markets have been very moderately supplied with all kinds of fat stock during the month. In the general quality and condition of both beasts and sheep there has been little or no improvement, consequently the yield of fat has been small. The deficiency in quality has had the effect of keeping up prices and of diminishing consumption. Fortunately for the graziers, the pastures have a most plentiful supply of food, and the price of linseed and cake is not so high as was anticipated when the war with Russia was commenced; still, owing to the unusually high value of lean stock in all parts of the country, grazing is now not so profitable a business as is generally imagined, and we see no prospect whatever of any fall in the quotations. The present state of the trade is exactly the same as we predicted some months since, viz., we have a comparative scarcity of stock in the country, a great deficiency in quality, with very moderate imports from abroad, whilst there is still great competition between the English and French buyers for Dutch stock. The following return shows the total supplies of stock exhibited and sold in the Metropolitan Market:—

	Head.
Beasts	20,816
Cows	555
Sheep and lambs	151,870
Calves	3,356
Pigs	4,272

STOCK SHOWED AT CORRESPONDING PERIODS.

	Beasts.	Sheep and lambs.	Calves.	Pigs.
1849	18,133	173,620	2,480	2,200
1850	19,390	181,490	2,548	2,291
1851	20,317	181,900	2,648	2,732
1852	21,049	165,770	3,350	2,785
1853	24,345	172,102	3,431	2,990
1854	21,384	164,920	4,286	3,870

During the past month the receipts of beasts from Lincolnshire, Leicestershire, and Northamptonshire have amounted to 9,500 shorthorns; from the Eastern districts, 2,000 Scots and shorthorns; from other parts of England, 1,950 of various breeds; and from Scotland, 597 Scots.

The imports into London from abroad have been—

	Head.
Beasts	5,941
Sheep	22,605
Lambs	984
Calves	2,484
Pigs	3,476

The annexed statement shows the arrivals at corresponding periods:—

	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1849	2,913	15,981	1,179	1,000	302
1850	4,277	17,376	2,370	1,945	581
1851	5,342	24,342	4,431	2,569	2,009
1852	5,316	23,632	3,576	2,867	1,856
1853	4,929	22,436	2,579	2,908	2,055
1854	5,507	19,770	1,178	2,495	2,176

The arrivals at the out-ports have been on a very limited scale—certainly under 3,000 head.

Beasts have sold at from 3s. 10d. to 5s. 4d.; sheep, 3s. 6d. to 5s. 2d.; lambs, 4s. 8d. to 6s.; calves, 4s. 4d. to 5s. 4d.; and pigs, 3s. 6d. to 4s. 6d. per 8lb., to sink the offals.

COMPARISON OF PRICES.

	Aug., 1852.		Aug., 1853.		Aug., 1854.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef	2 4	to 4 0	3 0	to 4 6	3 2	to 5 0
Mutton	2 6	to 4 2	3 4	to 5 0	3 4	to 5 0
Lamb	4 0	to 5 2	4 6	to 6 0	4 2	to 5 6
Veal	2 8	to 4 0	3 4	to 5 0	3 2	to 4 6
Pork	2 6	to 3 6	3 0	to 4 0	3 4	to 4 8

For the time of year, Newgate and Leadenhall markets have been well supplied with each kind of meat. On the whole the demand has ruled inactive as follows:—Beef, from 3s. 4d. to 4s. 8d.; mutton, 3s. 4d. to 4s. 10d.; lamb, 4s. 6d. to 5s. 8d.; veal, 3s. 8d. to 4s. 10d.; pork, 3s. 8d. to 4s. 6d. per 8lbs. by the carcase.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF AUGUST.

In the early part of the month of August, the rains continued as heavy as those of the previous month, and the depth fallen up to the 8th was considerable, and the fears of all parties connected with the trade were painfully aroused, lest a wet harvest should be experienced; but from that point the weather steadily improved, and from the 11th to the 18th was of the most favourable character; and between this period, harvest in all the early districts had commenced. As is usually the case a few weeks before the commencement of this important field work, the farmers made larger deliveries of wheat, and there appeared a desire to obtain the prices then current as satisfactory, and to clear out the remnant of their stock: this feeling being so universal, caused a decline to take place, and this was the more remarkable, as it continued even during the prevalence of bad weather, and there was no check to it until the busy occupation of the farmers caused a great falling off in their deliveries; then the millers found their stocks so reduced, that they appeared more inclined to increase them, fearing that if they missed the present opportunity, it would not again be in their power to secure much more of the fine old qualities, of which generally they liked to retain a little against all contingencies of the quality of the new crop, although the prices appeared to them to be still too high to hold much stock, and they did not purchase with that confidence they would have done, had the currency been a little more reduced, and the price brought down about as much more as it had already fallen.

At Mark-lane on the first Monday of the month, there was a fair supply of wheat from Essex and Kent, but not much from distant counties. The trade was dull at a reduction of 2s. per qr., the top price of red being 76s., and that of white 84s. per qr., and some quantity was left over unsold for future markets. The demand for foreign wheat was equally limited, and all sorts were 2s. per qr. cheaper: many of the cargoes arriving in poor condition were taken to granary for improvement and cleaning, and will come out later on, when samples of old become scarce; the best red Pomeranian was worth 80s. per qr., and the finest Danzig 86s. per qr. The imports were only moderate, consisting of 201 qrs. from Antwerp, 272 from Bilboa, 655 from Danzig, 52 from Dordt, 1,200 from Genoa, 28 from Gothenburg, 1,461 from Hambro', 244 from Limpias, 1,200 from Marseilles, 286 from Marstrand 550 from Norkoping, 682 from Oporto, 546 from Rostock, 1,650 from Smyrna, 220 from Stockholm, 320 from Stolpemunde, and 640 from Stralsund, making a total of 10,207 qrs., against 9,792 qrs. the corresponding week of last year. The London average registered 80s. 3d. on 5,678 qrs. The general return was 77s. 7d. on 109,891 qrs. against 69s. 8d. on 41,558 qrs. the correponding week of last year. It will be seen that the deliveries in all the agricultural districts have been well kept up; but the returns being now made more accurately, and from parties who had not previously complied with the law, the quantity is thus materially increased by being more than once returned, first by the buyers of the farmers, and then by merchants selling in London or by the factors there, and by numerous buyers in the large consuming towns, and this at least deranges the previous comparison, and it will be the case for some time to come.

At Mark-lane, the second week of the month, the supply of wheat was short from Essex and Kent, with a very limited quantity from distant counties, and a fair sale was experienced for all good qualities; whilst secondary sorts were taken off slowly, and had these been forced, lower prices must have been accepted, but some quantity was left over unsold. There was very little passing in foreign wheat, and quotations were almost nominal, the importers refusing to take less money. The quantity arrived was rather moderate, consisting of 45 qrs. from Antwerp, 200 from Bandholm, 3,423 from Danzig, 200 from Engelholm, 515 from Hambro', 340 from Neustadt, 900 from Norkoping, 850 from Seville, 56 from Stettin, 631 from Stockholm, 1,000 from Stralsund, 161 from Tonning, and 2,467 qrs. from Wolgast, making a total of 10,790 qrs., against 21,837 qrs. the corresponding week of last year. The London average registered 79s. 7d. on 2,785 qrs.; the general average was 78s. 2d. on 99,758 qrs., against 64s. 8d. on 31,184 qrs. the corresponding week of last year. During the whole of this week the weather was of the most splendid character, and a considerable breadth of wheat was cut. On Thursday one sample of new appeared at Uxbridge market, of good quality, weighing 63lbs. per bush., and it was sold for 82s. per qr. At Mark-lane, the following day, two samples were sold—one at 76s., fair quality and condition; for the other the price was left open

until the next market day: the weights of these would be 61 and 63lbs. per bushel. Old wheat was sold at 1s. to 2s. per qr. under Monday's currency, the favourable state of the weather inducing the factors to give way, although the supply of English was very limited.

The quantity of wheat brought forward the third week in Mark-lane was very short, as well from Essex and Kent as from every other county, and notwithstanding the weather was showery during the morning, the town millers took it off slowly, at about the rates of Friday; but with this difference, that a somewhat firmer tone was springing up. It was generally expected that a good supply of new would appear at that day's market, from the farmers having had a whole week of such very favourable weather; but they were too busy with field work to thrash, and only a few samples appeared, which proved of very various quality, from good fair to low, with an irregular condition, and weighing from 58 to 63lbs. per bushel; the prices paid ranged from 70s. to 78s. per qr. The buyers appeared disappointed at not having more of this year's growth, as generally they wanted to give it a trial. Foreign wheat was held with more firmness, which checked sales, and few transactions took place in consequence. The imports consisted of 870 qrs. from Anclam, 193 from Copenhagen, 2,993 from Danzig, 320 from Greifswalde, 320 from Homersiel, 1,105 from Kioge, 330 from Landscrona, 300 from Odense, 3,810 from Rostock, 250 from Rugenwalde, 1,260 from Smyrna, 282 from Stettin, 225 from Stockholm, 840 from Stralsund, 300 from Tettenbulspiker, and 1,930 qrs. from Wolgast, making a total of 15,828 qrs., against 6,929 qrs. the corresponding week of last year. The London average registered 78s. 10d. on 5,132 qrs.; the general average was 77s. 7d. on 84,584 qrs.; the corresponding week of last year was 62s. 3d. on 35,860 qrs. The difference both in price and quantity of the two years was very great; and at this period last year the markets began to fill with new wheat, with a great determination on the part of the farmers to sell, which sent down the prices to 50s. per qr. for the choicest samples of red, and 56s. for white; these prices were paid on the 4th September, but from that day a reaction took place, and an advance of 20s. per qr. within three months was established.

The supply of English wheat at Mark-lane the fourth week of the month was moderate, consisting principally of new from Essex and Kent, there being nearly 1,100 qrs. on sale, exhibiting a variety of quality; and although some samples of new were sold the previous week, this day's market must be considered the opening one fairly of the season. At all markets held on Saturday there was much activity, and an advance of 2s. to 4s. per qr., according to the quantity shown, was established; this brought forward numerous buyers, who had imprudently allowed their stocks to go down very low, notwithstanding the superior quality of last year; and this, combined with the unfavourable reports of the crop, enabled the factors to obtain good prices. Fair runs of new white Essex and Kentish commanded 80s. per qr.; finer samples, 82s.; and picked qualities, 84s. per qr. The supply was principally of this description, for only a few parcels of red appeared; those from Kent were better than the white as to weight and condition, and these brought 75s. to 76s., and selected samples rather over the latter price. The average weight would be about 61lbs. per bushel, some fine parcels ranging from this up to 63lbs., and even 64lbs.; whilst inferior could be found only 58lbs. Fine old English wheat was in good demand at 3s. to 4s. per qr. over the currency of the previous Monday, 63lbs. select red having reached 80s. per qr., and very fine white up to 86s. per qr. Foreign wheat was in fair request at 3s. to 4s. per qr. more money on all good useful qualities. The imports of the week consisted of 580 qrs. from Bilboa, 2,115 from Danzig, 740 from San Sebastian, 460 from Seville, 530 from Stralsund, making a total of only 4,665 qrs., against 13,760 qrs. in the corresponding week of last year. The London average registered 77s. 2d. on 3,653 qrs. The general average was 75s. 9d. on 75,681 qrs.; the corresponding week of last year was 64s. on 45,925 qrs. The next few weeks' returns will be very limited, and the millers throughout the country will have some trouble to get as much as they require to keep their mills going. This will be the pinch before a general supply of new corn can be brought to market.

The fluctuations in the prices of country flour have been numerous, from various causes; but the top price of town-made has been tolerably steady throughout the month. The arrivals the first week were 1,284 sacks coastwise, by the Eastern Counties Railway 11,445 sacks, by the Great Northern Railway 1,651 sacks, and from foreign ports 2,966 sacks and 100 brls. The top price of town-made flour was 70s. per sack, households 61s. to 63s., country marks 56s. to 58s., and Norfolks 53s. to 54s.; Spanish qualities were 58s. to 60s. per sack. The arrivals the second week were 2,977 sacks coastwise, 10,668 sacks by the Eastern Counties Railway, 1,206 sacks by the Great Northern Railway, with 3,568 sacks foreign, principally from Spain. There were rather more pressing sellers this week, and Norfolks were disposed of at 51s. to 52s., and in one or two instances down to 50s., other country marks being disposed of in

proportion; and on Friday some good Spanish was sold at 56s. per sack; and although the nominal top price was called 70s. generally, a few millers took 68s. per sack, households selling at 60s. to 61s. per sack. The arrivals the third week were 1,349 sacks coastwise, 9,193 sacks by the Eastern Counties Railway, 1,395 sacks by the Great Northern, but only 372 sacks from foreign ports. On Monday trade was irregular, but still the top price of town-made was but nominally 70s., with here and there a seller at 68s.; households 60s. to 61s., Norfolks at 51s. to 52s. On the following Wednesday a sudden demand sprung up for Spanish and Norfolks, to export; when 59s. was the price paid for the former, and 52s. 6d. per sack for the latter. The arrivals the fourth week were 1,858 sacks coastwise, 8,823 sacks by the Eastern Counties Railway, 1,531 by the Great Northern Railway, and 9,003 from foreign ports. The top price of town-made flour was 70s. per sack, with no sellers at 68s.; and households were 61s. to 63s., Norfolks 55s. per sack; and all sorts were in good demand at improving prices, brought about by the prospect of large quantities being wanted for many parts of the continent, as well as France. Spanish, of prime quality, commanded 61s. per sack.

During the earlier part of the month the article of barley was in good request, and fine fresh qualities realized 1s. per qr. more money—the arrivals of every description being moderate, and the distillers taking fine qualities freely. The second week there was an increased import of foreign, amounting to 6,804 qrs.; and no change in the value of any description took place, the demand being steady for general purposes. The following week the imports of foreign were still larger, amounting to 11,601 qrs., and prices of grinding samples gave way 1s. per qr. On Monday in this week, the first of this year's growth appeared from Kent, when four samples were sold at from 32s. to 35s. per qr., of a coarse quality, but in fair condition, and the weight would average 52lbs. per bushel. At Edinburgh, on Wednesday, several samples appeared. The top quality commanded 37s. 6d., although it only weighed 53½lbs. per bushel, being 2 to 3lbs. per bushel lighter than the best of the growth of last year. On the fourth Monday of the month the imports of foreign had greatly fallen off; in fact, not a single quarter of this description was reported. The supply of English was little increased, and the quality of the new was about the same as the previous week; coarse 52lbs. in fair condition, and this was taken off very slowly at 32s. to 33s. per qr., whilst fresh heavy old foreign was taken pretty readily at 1s. per qr. more money.

The averages were 34s. 8d. on 5,585 qrs. the first week, 35s. on 7,288 qrs. the second week, 34s. 8d. on 5,546 qrs. the third week, and 34s. 2d. on 6,010 qrs. the fourth week. The quantity will now increase weekly, as new will appear in all the early districts; and if fine samples are brought forward, these will command good prices until the distillers are well in stock, as they commence to make malt without duty on that article, paying only 2d. per gallon on the spirit.

There have continued to be the most trivial arrivals of oats from our own coast throughout the month, with only moderate supplies from Ireland; but this deficiency has amply been made up by the large importations of foreign, and those from Sweden and Norway have almost compensated for the loss of the Russian supply. The arrivals the first week were 242 qrs. coastwise, 269 qrs. by the Eastern Counties Railway, 18 qrs. by the Great Northern Railway, 150 qrs. from Scotland, 4,065 qrs. from Ireland, and 23,843 qrs. from foreign ports—making a total of 28,587 qrs. The best qualities supported prices, but parcels out of condition were rather lower. The arrivals the second week were 355 qrs. coastwise, 380 qrs. by railway, 1,932 qrs. from Scotland, 800 qrs. from Ireland, and 29,869 qrs. from foreign ports—making a total of 33,336 qrs. Fresh heavy corn realized full prices, and other sorts were in improved demand. The third week the arrivals were 30 qrs. coastwise, 46 qrs. by railway, 335 qrs. from Scotland, 620 qrs. from Ireland, with the immense import of foreign amounting to 49,550 qrs.—making a total of 50,581 qrs. This large quantity on sale enabled the dealers to get into stock on somewhat lower terms for even the choicest qualities, whilst secondary sorts were obtained 6d. to 1s. per qr. under previous prices. The country demand, however, keeping up, there was no pressure in the sales; and, unless the imports are well kept up, prices of good old corn must be enhanced, from the poor crop and dearness of hay. The arrivals the fourth week consisted of 14 qrs. coastwise, 564 qrs. by railway, 900 qrs. from Scotland, 4,355 qrs. from Ireland, with 5,397 qrs. from foreign ports—making a total of 11,230 qrs. This falling off gave more firmness to the trade, and an advance of 6d. to 1s. was established on the best qualities, other sorts being in improved demand. The averages were 29s. 1d. on 11,042 qrs., 28s. 11d. on 8,827 qrs., 29s. 1d. on 8,827 qrs., and 29s. 1d. on 8,123 qrs., exhibiting much steadiness in this article during the entire month.

There have been moderate deliveries of beans throughout the month, and a fair steady demand has been experienced, without any great variation in the value of good qualities, the consumption being tolerably well kept up. The imports from

the north of Europe have been very trivial, and those from Alexandria moderate, as well at this port as at Liverpool and Glasgow, and prices have been steady. The stocks of old are everywhere much reduced, and as soon as new can be brought forward, they will most probably meet a good sale, something under the prices of old: the high rates paying for cakes will tend to keep up the value of this article, and there is no fear of a remunerating price being continued throughout the season. The weekly averages have been 46s. 4d. on 2,917 qrs., 46s. 11d. on 2,241 qrs., 47s. 3d. on 2,200 qrs., and 46s. 6d. on 2,300 qrs.

Peas have been exhausted the nearest of any article, and most trivial quantities have for weeks been brought forward; but the consumption having been very limited, prices have been little affected by the short supplies, and a few parcels of foreign have occasionally dropped in, filling up the deficiency of English, and now that new will be steadily brought to market, there does not seem much prospect of any material variation in prices: what may affect them most is the prospect of getting no supply of boilers from the Baltic, owing to the unfavourable reports of the crop throughout Prussia and the German States. Indeed it might be that this article will be exported from England, to provide food for the poorer classes in many parts of the continent, before the winter sets in. New clay-coloured samples have appeared for two weeks, and commanded 38s. to 40s. per qr. The averages have been 42s. 4d. on 165 qrs., 42s. 5d. on 375 qrs., 43s. 1d. on 189 qrs., and 43s. 7d. on 183 qrs.

The imports of foreign grain for the month ended the 31st July, as published in the *London Gazette* of the 17th August, were 827,814 qrs. grain, and 288,550 cwts. flour, against 641,769 qrs. grain, and 250,103 cwts. flour, the corresponding month of last year, and the different sorts stand thus—viz.:

	1854. QRS.		1855. QRS.
Wheat	281,950	..	346,792
Barley	107,679	..	71,762
Oats	110,017	..	181,739
Rye	—	..	422
Beans	29,181	..	49,171
Peas	6.265	..	10,596
Maize	106,677	..	167,298
Bere	—	..	34
Total qrs.	641,769	..	827,814
Flour, cwts.	250,103	..	288,550

The imports of wheat in this list are less than those of the previous month, but the increase is made up in oats and maize, both these articles being larger than the previous month. The arrivals of wheat will continue to fall off, the supplies in the Baltic being completely exhausted, and fine qualities higher there now than in the London market.

Whilst the English markets were drooping and depressed, those of the north of Europe were steadily advancing—the weather generally there being of the most unfavourable character, and the crops receiving much injury. By the last advices from Danzig, prices of wheat were considerably higher; a speculative demand having sprung up for the interior, 5000 qrs. were taken at an advance of 5s. to 6s. per qr.—in some instances the enhancement was 7s. per qr., and up to 82s. per qr. free on board was the rate obtained for 61 to 62 lbs. high mixed, 79s. to 81s. for 61 lbs. good mixed, 76s. to 80s. for mixed descriptions, 60 to 61 lbs. This enhancement is brought about by the very unfavourable reports of their crops, and these prices are considered the highest established throughout the year.

There has not been the same animation at Rostock as at Danzig, although the crops there are not much better than elsewhere, but the stocks are so exhausted that business is checked, and there seems little prospect of England receiving any more from that port this season, beyond a few straggling vessels still at sea, which may be expected to arrive with the first shift of wind. Prices there are much the same as those for an equal description in the London market, and this season the quality has been much worse than previously, and will be still worse during the next shipments, if any of this year's growth can at all be looked for.

The Belgian markets are very high for wheat, and shipments are made to them from many places; and large sales are effected for towns up the Rhine. Their requirements are likely to be very great: whilst in Holland the corn trade has become much excited, from the failure of the crop of rye in all the Rhenish provinces; and, indeed, wherever this article has been grown, there appears to be a deficiency to the extent of one-third of an average yield. At Rotterdam, purchases of this article and of wheat are now being made at extravagant prices, and to a very considerable extent, for shipment up the Rhine; and the prospects for those countries whose populations live on rye-bread are of the most gloomy character, causing great alarm and anxiety.

As regards France, that country was not more than from one week to ten days before England with her harvest; and it is disappointing the whole nation, turning out under an average; and a great rise has, in consequence, taken place both in wheat and flour. In our last "Review," we left flour at Paris quoted at 90 francs for the best marks, and

only 80 francs was the rate bid for future delivery, indicating the feeling and opinion then of their harvest prospects; and the stocks were reduced to 18,455 quintals. Such has been the rapid advance in this article, that 100 francs per sack of 159 kilos. (equal to about 66s. per sack of 280lb.) has been attained; and for distant delivery, the present price is 94 to 95 francs; and the stock at Paris was only 7,574 quintals., on the 25th of August. During the week her Majesty spent at that great city, the sales of flour were very large: in one day, they amounted to 16,000 sacks, the population having been, for the occasion, increased in extent 600,000; and the bakers, being low in stock, had to purchase daily to a considerable extent, each day paying more for the article, until the above rate had been attained. The deliveries of wheat have been very short, from the busy occupation of the farmers in that country with their harvest; and prices at Paris are 80s. to 82s. per qr. of 480lb., for the qualities grown in the neighbourhood, and 80s. to 81s. for fine new from Nantes. The weights are irregular, varying from 56 to 59lb. per bushel: quality and quantity are, therefore, considered under the usual average of years. The last advices are of a quieter tendency; and if the farmers can supply the markets better, the present rates would not be kept up: and some sales, for delivery in September, have already been effected at about 6s. per qr. under the currency of the day.

From the United States, the usual flourishing advices previous to harvest were received; and the superabundance of their crops induced the Americans to promise a supply to every country requiring one, to any extent demanded; such was the exuberance they expected to have to spare. Towards the close of July, however, heavy rains set in throughout some states, and caught them in the midst of harvest. The atmosphere being very warm, much was sprouted; and the advices received then were of a totally different character, much grain being reported to be entirely spoilt; and very exaggerated accounts were put forward, changing their prospects wonderfully. Afterwards, the weather became finer; and this dispersed their gloomy notions, and cheered them up, enabling them to conclude that they would have a "good crop;" and, subdued as was this tone, prices were still tolerably high, southern white being worth 1 d. 95c. to 2 d. 10c. per 60lb. (being about 66s. to 72s. per 480lb., without shipping expenses), and for red 1 d. 85c. to 1 d. 90c. (or about 61s. to 64s. per 480lb.); and of the new crop, 3,177 bushels had been shipped to Liverpool, and 2,989 bushels to Havre, both from New York, with 2,122 barrels flour to London, and 879 barrels to Liverpool. Future advices will determine whether America will have so much to spare as other countries may require.

We must now turn our attention to the progress and prospects of our own crops; and there have been various vicissitudes in them since our last review—much for and much against them. As respects the heavy rains, those which fell on the 7th and 8th of the month did a great deal of mischief: previously, the alternate showers and sunshine filled the ears, and pushed forward the earliest wheats to maturity; so that harvest partially commenced about one week before the time promised or pointed at during the previous month. On the 13th, in early districts, harvest operations had been begun freely; and on Friday, the 17th instant, the first sample of new wheat was shown in Mark-lane —quality fair, weight about 61lb. per bushel. Although taken by one of our leading millers, the price was not fixed on that day. The weather during this week was of the most splendid character; and much work was accomplished in good order. It was mostly supposed that a general supply of this year's growth might be brought forward on Monday, the 20th of the month; but the farmers appeared more determined to take advantage of the fine weather, and pushed on the securing of their crops, in preference to thrashing out. They were induced to this course the more by the previous dulness of the trade, and recent decline in prices. Only a few samples appeared; and this seemed to disappoint the millers, as they had allowed their stocks to run down very low, in expectation of a "rush" similar to that of last year to be first to market, and to obtain the good prices current before that season's splendid harvest was secured. Not so, however, this year; the farmers having paid for their experience smartly—at least, those who filled the markets so liberally, and sent down prices so rapidly. The few samples which appeared were from Essex and Kent; quality very various, from good fair to low; and the opening prices were from 70s. to 78s. per qr., weights ranging from 58 to 63lb. One parcel from Kent was reported to have been sold at 68s. per qr.; but this was in too poor condition to grind, and no miller would have it; consequently, it was taken home unsold.

The only check to harvest operations this week was a most violent thunder-storm, which commenced at midnight on the 23rd of the month, and which appeared to have been very general. Our meteorological friend says, "as the temperature after the storm was kept up, harvest operations would not be suspended a *single hour*;" and although he has been very correct so often in his predictions of storms, we think he is more at home in showing that planetary influence does exist, than

in his views of farming operations; at least, we fancy that our friends the farmers who had this deluge of rain on their crops, would prudently give them a little more time to get rid of the excessive moisture then experienced. The reports about short yield began to be very prevalent towards the close of the week, and all markets held on Saturday were more animated than for a long time past, and an advance varying from 2s. to 4s. per qr. was established. This reaction had its wonted effect in Mark-lane on Monday the 27th instant, and the advance of 3s. to 4s. per qr. on the finest samples of old noticed previously in this review took place, choice 63lbs. red bringing 80s. per qr., and 65lbs. white Kentish 86s. per qr. Every description of buyer appeared to be out of stock, and the enhancement was purely caused by a consumptive demand for the metropolis and distant parts of the country.

A great breadth of land had been cleared from the 20th to 27th, and some portion has been stacked in a damp state, and this we think will be unfit to be thrashed until after the March winds of next year have improved its condition. Whilst the weather remains favourable, the occupation of the farmers will prevent large deliveries, although the improved state of the market will have its effects on the minds of the agriculturists, as 80s. per qr. for new white about 61lbs. per bushel is not a despisable price, and 82s. per qr. for a finer quality will remunerate the growers, and if these rates continue, another good year will be the result!

Our advices now indicate that work progresses well, and we do not hear of any material complaint of the want of hands. If we draw a line across the country from Wisbeach to Barmouth, we think fully one-half of the English crops will have been secured, and on the whole in fair order. From that line to the Humber the work is now going on pretty extensively, and one-half in that portion will soon be safe. Further north the operations have commenced, and in another week half up to Scotland will have been finished. In the Lothians the sickle is now at work, and with favourable weather great progress will be made; this is very desirable, as the condition being good, the most will be made of the produce, and every bushel can then be used for one purpose or other. With respect to the quantity of wheat anticipated, we look upon our information as indicative of the yield being one-third short of the most splendid crop of last year, and we adhere to the estimate given in our last review, that it will barely prove an average crop as to quantity, whilst the weight will be less by 2lbs. per bushel in flour, taking every description of quality into account, and this difference alone would be equivalent to about 885,750 sacks flour on the whole crop. One-third of the wheat will prove of good quality, one-third a moderate description, and the remaining third of light inferior quality—that all will be available if the weather continue fine until the harvest has been completed, and in this position England will be much better off than full half the continent of Europe with respect to breadstuffs.

With respect to barley, the opinion expressed in our last review will now scarcely be realized: we then said it would be a full or large yield, but we fear circumstances have occurred since of blight that will take off a little: it will be a fair crop, but there will be much of a coarse quality, which will only do for distilling and grinding purposes, and only a small portion of really fine malting quality. The oat crop will be a moderate one. Beans spring-planted good, and peas also; these two last articles have been kept clear of their accustomed enemies by having been so often thoroughly cleansed with the heavy rains. Bringing into operation the long range, and referring to our advices from all quarters of the "wide wide world," we come to the conclusion that a foundation is laid for another dear year of breadstuffs, and that our agriculturists will again have much in their own power, as has proved to be the case since they felt their real position after last harvest; the stocks have been closely worked up of most articles, and the consumption will commence in good earnest on the new corn, and it will be well for the millers if here and there a few samples of prime old wheat can be found: they will know how to appreciate such when they have tried some of the secondary descriptions of new, and whenever the atmosphere becomes a little soft, these fine qualities will not be so despised as they have been in the early part of the month.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter			
WHEAT, Essex and Kent, white	75 to 78	extra	78	84
Ditto, red.....	68	72	„ 74	76
Norfolk, Lincoln. and Yorksh., red	70	72	„ 70	75
BARLEY, malting, new.. 30 31	Chevalier..		32	35
Distilling.... 30 32.....	Grinding ..		29	31
MALT, Essex, Norfolk, and Suffolk, new	64	66	extra	69
Ditto ditto old	65	68	„	69
Kingston, Ware, and town made, new	68	70	„	71
Ditto ditto old	67	—	„	70
RYE	—	—	40	43
OATS, English feed.. 25 26	Potato..		26	32
Scotch feed, new 28 29, old 32 33 ..	Potato		32	33
Irish feed, white	24	25	fine	27
Ditto, black	23	25	„	26
BEANS, Mazagan.....	38	40	„ 40	41
Ticks.....	39	43	„ 42	43
Harrow.....	39	42	„ 42	44
Pigeon	42	47	„ 47	48
PEAS, white boilers 42 47.. Maple 40 42	Grey		37	40
FLOUR, town made, per sack of 280 lbs.	—	—	68	70
Households, Town 64s. 65s. Country	—	—	57	60
Norfolk and Suffolk, ex-ship	—	—	54	55

FOREIGN GRAIN.

	Shillings per Quarter					
Wheat, Dantzic, mixed	85 to 86	high mixed	—	extra	93	
Konigsberg	79 81	„	—	85 „	87	
Rostock, new	79 81	fine		85 „	90	
American, white	83 85	red		76	78	
Pomera., Meckbg., and Uckermk., red	79 80	extra		80	84	
Silesian	„ 76 78	white		80	82	
Danish and Holstein	„ 69 75	„		75	79	
Rhine and Belgium	„ — —	old		—	—	
Odessa, St. Petersburg and Riga	70 72	fine		74	76	
Barley, grinding 28 31		Distilling		30	32	
Oats, Dutch, brew, and Polands 28s. to 29s.		Feed		26	27	
Danish & Swedish feed 26s. to 28s.		Stralsund		27	29	
Russian 27 30		French		none		
Beans, Friesland and Holstein				42	43	
Konigsberg	39 43	Egyptian		37	38	
Peas, feeding	39	40 fine boilers		43	45	
Indian Corn, white	47	48 yellow		47	50	
Flour, French, per sack	—	— Spanish		60	61	
American, sour, per barrel	40	42 sweet		40	45	

PRICES OF SEEDS.

BRITISH SEEDS.

Coriander (per cwt.)	20s. to 24s.
Carraway (per cwt.) new 40s. to 44s., old	40s. to 44s.
Canary (per qr.)	50s. to 54s.
Hempseed (none)	00s. to 00s.
Linseed (p. qr.) sowing .. s. to .. s., crushing	70s. to 76s.
Linseed Cakes (per ton)	£12 0s. to £12 10s.
Rapeseed (per qr.)	new 84s. to 86s.
Ditto Cake (per ton)	£6 10s. to £6 15s

FOREIGN SEEDS, &c.

Hempseed, small, (per qr.)	48s. 50s., Ditto Dutch, 54s.
Coriander (per cwt.)	15s. to 20s.
Carraway	36s. to 38s.
Linseed (per qr.) Baltic, 70s. to 72s.; Odessa, 72s. to 75s.	
Linseed Cake (per ton)	£11 10s. to £12 10s.
Rapeseed, Dutch	80s. to 84s.
Rape Cake (per ton)	£6 10s. to £6 15s.

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
July 14, 1855..	75	11	34	7	28	8	44	8	45	11	42	4
July 21, 1855..	76	4	34	8	28	5	45	2	46	0	42	10
July 28, 1855..	77	7	34	8	29	1	43	1	46	4	42	4
Aug. 4, 1855..	78	2	35	0	28	11	46	11	46	11	42	5
Aug. 11, 1855..	77	7	34	8	29	1	47	2	47	3	43	1
Aug. 18, 1855..	75	9	34	2	29	1	42	4	46	6	43	7
Aggregate average of last six weeks	76	11	34	8	28	10	44	11	46	6	42	10
Comparative avge. same time last year	67	10	35	10	29	5	45	4	47	11	44	8
Duties	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Av. s.	d.	Averages from the corresponding *Gazette* in 1854.	Qrs.	Av. s.	d.
Wheat	75,681	75	9	Wheat	45,925	64	0
Barley	6,010	34	2	Barley	2,212	34	6
Oats	8,123	29	1	Oats	7,492	27	9
Rye	241	42	4	Rye	43	43	1
Beans	2,300	46	6	Beans	3,457	49	10
Peas	183	43	7	Peas	197	44	8

HOP MARKET.

BOROUGH, Monday, Aug. 27.

The high winds of last week are stated to have done considerable injury to the new crop, and in some districts the red mould has made its appearance to some extent. Should the latter continue to spread, the present high estimate of duty must be materially lessened. There has been rather more demand during the past week for the few hops remaining on sale at somewhat improved rates. Duty £290,000.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

Monday, August 27.

Very large supplies of home-grown potatoes are on sale here, and about 20 tons have arrived from abroad since Monday last. An extensive business is doing, as follows:—Middlings, 45s. to 50s.; best, 60s. to 70s. per ton.

COUNTRY POTATO MARKETS.—York, Aug. 18.—To-day we had a good supply of new potatoes, of excellent quality; large ones 3d., small ones 1½d. to 2d. per quartern. Leeds, Aug. 21.—We had a fair supply of new potatoes, which were sold at from 9d. to 10d. per 21lbs. wholesale, and 2½d. per 5lbs. retail. Malton, Aug. 18.—A moderate show of new potatoes, sold at from 9d. to 16d. per peck. Richmond, Aug. 18.—New potatoes 4s. per bushel. Sheffield, Aug. 21. — Potatoes sell at from 8s. to 10s. per 18 stones. Manchester, Aug. 21.—New potatoes, 7s. to 8s. 6d. per 252lbs.

ENGLISH BUTTER MARKET.

London, August 27.

Trade is dull with us, and price nominal.

Dorset fine	102*s.* to 104*s. per cwt.*
Do. middling	92*s.* to 96*s.* „
Devon	96*s.* to 98*s.* „
Fresh	10*s.* to 13*s. per doz. lbs.*

WOOL MARKET.

ENGLISH WOOL MARKETS.

This Day.—Although there is no great pressure of supply, our market is in a most inactive state. No actual decline has been submitted to in the quotations, but to effect anything with large sales, lower rates must be submitted to.

	s.	d.		s.	d.
Down tegs	1	0½ to	1	1½	
Do. ewes	0	11 —	1	0½	
Half-bred hoggets	0	11½ —	1	1	
Do. wethers	0	11 —	1	0	
Kent fleeces, mixed	1	0½ —	1	1	
Leicester fleeces	0	11½ —	1	0	
Combing Skins	0	10½ —	1	1	
Flannel Wool	1	0 —	1	2	
Blanket Wool	0	8 —	1	0	

LEEDS WOOL MARKET, August 25.—Wools are steady in price, but the local brokers are not experiencing a very active demand. Many manufacturers, having laid in a stock at the recent sales in London, can for the present do without calling upon the local dealer, unless it be for some particular kinds of wool to work up their own stock with.

YORK WOOL MARKET, Aug. 23.—We had a limited show, and few buyers. Mixed lots of good-bred hog and ewe-fleeces 14s. 6d. to 15s. 6d. per stone, as per count. Moor and last wools were most in demand, the former at from 8s. 6d. to 9s., and the latter at from 10s. to 12s. per stone. Twenty-four sheets of Moor wool, sold by Mr. Redman Rhea, of Pickering, to Messrs. Kelly and Sons, of Heckmondwike, were very superior, both in colour and quality, and sold for the highest price of the day.—*Yorkshire Gazette.*

LIVERPOOL WOOL MARKET, August 25.

Scotch Wool.—The demand for Laid Highland is fair, but the selection is yet indifferent. White is in fair demand, with a good supply. Cheviot and Cross are in good demand at full rates, the clip only coming forward slowly.

		s.	d.		s.	d.
Laid Highland Wool, per 24lbs.	..	9	6	to 10	3	
White Highland do.	..	13	6	14	0	
Laid Crossed do..unwashed	..	12	0	13	6	
Do. do..washed	..	13	6	15	0	
Laid Cheviot do..unwashed	..	14	6	16	0	
Do. do..washed	..	16	6	19	6	
White Cheviot do. do	..	24	0	28	0	

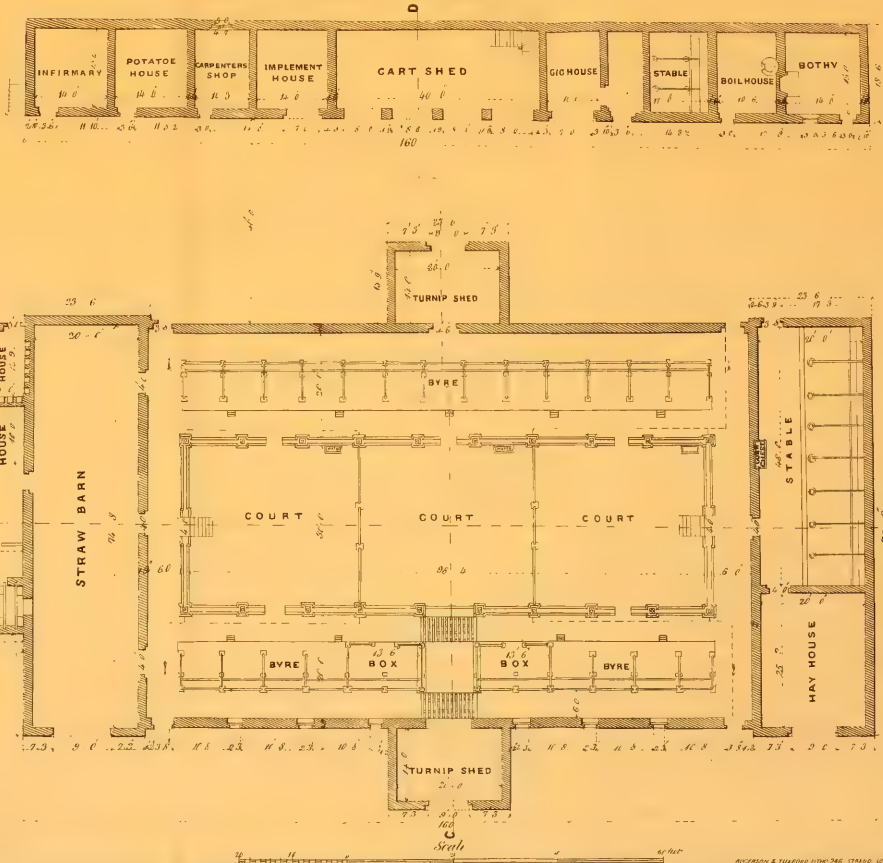
Foreign Wool.—Since the close of the sales last week, there has been little in stock to do with; the trade is healthy; with a better selection should have more doing.

Printed by Rogerson and Tuxford, 246, Strand, London.

Nº 1.

DESIGN FOR A COVERED HOMESTEAD AT SILLYFLATT, KINCARDINESHIRE N.B.

DESIGNED BY DAVID DICKSON, ESTATE AGENT, LAURENCEKIRK, N.B.



THE FARMER'S MAGAZINE.

OCTOBER, 1855.

PLATE I.

NO. I.—DESIGN FOR A COVERED HOMESTEAD, AT SILLYFLATT, KINCARDINESHIRE, NORTH BRITON.

The covered homestead, of which the accompanying plate is the first of a series of three copies of the working plans, was erected in the year 1853, on the farm of Sillyflat, county of Kincardine, North Briton, by the proprietor, James Farquhar, Esq., of Hallgreen, and has on trial been found all that could be desired.

The dimensions of the buildings will be seen on reference to the scale attached, and as the name of each department is given, little requires to be said in the way of explanation. The object wished to be attained by covered homesteads, is to have the whole bestial straw and manure under roof, and that has been here accomplished. It will be seen that after the grain crop has been placed in the sheaf-loft, the straw is not again exposed until it is taken out of the court in the shape of well-made manure ready to be ploughed into the soil.

The stalls on each side of the courts are for feeding cattle and milch cows, the boxes being for calves, and the liquid manure flows from the stalls and boxes into the courts, the solid being also deposited there by opening one of the gates shown on the iron railing surrounding the courts. It will be observed that the courts are six and a half feet below the level of the stalls, and are calculated to contain the whole manure made from one crop. The stable manure is in the same manner put into the courts, on which about thirty-six young cattle are kept, and the manure is in consequence well made. There being a turnip store on each side of the building, and three doors leading from the straw barn, from which the different kinds of straw can be taken, the cattleman does the whole of his work under cover; and as the passages before and behind the cattle are of ample width, it is easily accomplished, as is evidenced by the fact that one man can without difficulty feed and superintend 100 cattle, 16 or 18 calves included.

The stalls and courts are covered by three roofs laid with Welsh slates, without lime; and the building is consequently well ventilated.

The detached wing contains an ample granary and other houses, and the whole is of the best description of masonry, and cost the proprietor £1,150, to which may be added about £150 for carriages performed by the tenant. The buildings, which are suitable for a farm of 200 or 300 acres, and could be enlarged or diminished to suit either a large or small farm, were designed by David Dickson, Estate Agent of Lawrencekirk, North Briton, the factor on the property.

Plates II. and III. will appear in the November and December numbers.

PLATE I.

A SHORT-HORNED COW,

THE PROPERTY OF CHARLES TOWNELEY, ESQ., OF TOWNELEY PARK, BURNLEY, LANCASHIRE,

For which the first prize of Twenty Sovereigns, and Gold and Silver Medals, were awarded at the Smithfield Club Cattle Show, December, 1854; and the first prize of Ten Sovereigns at the Birmingham Cattle Show, December, 1854.

THE HOP CULTURE AND COMMERCE OF OTHER COUNTRIES COMPARED WITH OUR OWN.

BY P. L. SIMMONDS,

AUTHOR OF "THE COMMERCIAL PRODUCTS OF THE VEGETABLE KINGDOM," ETC.

Believing that the extent of the foreign culture and trade in hops is but little known to our own hop-farmers, I have collected together some recent statistics and data, showing the progress that is making in other countries, which may prove useful for reference at the present time.

Hops are becoming an important article of foreign as well as domestic commerce in America. The hop plant was introduced into the British North American colonies soon after the first European settlements, and cultivated in New Netherlands in 1629, and in Virginia as early as 1648.

The quantity of hops exported previous to 1848 from the United States was as follows:—

1842.....	399,188 lbs.
1843.....	1,182,565 „
1844.....	664,633 „
1846.....	286,754 „
1847.....	1,227,453 „
1848.....	257,016 „

1294 tons of hops were stated to have been used in America in 1850. The amount of hops raised in the United States in the year 1839, according to the agricultural census returns, was 3,497,029 lbs., of which New England raised 707,743 lbs., New York 2,536,299 lbs., and all the other States but 253,987 lbs. Vermont, New Hampshire, and Massachusetts are the principal hop-growing states in New England. The first-named raised in 1849, 288,023 lbs.; Vermont increasing 239,886 lbs. in ten years; New Hampshire 13,749 lbs.; and Massachusetts diminished 133,200 lbs.; while New York increased in ten years 2,089,040 lbs. The hop trade of America is destined to be one of great importance, although the produce is yet rather limited, the breadth of land devoted to the cultivation not exceeding 8000 acres. The average crop and consumption hitherto have not exceeded 20,000 bales, of 200 lbs. to the bale. Last year's growth was beyond the average, by at least 6000 to 8000 bales, and a brisk export demand was the result, at very remunerative prices—40 cents (1s. 8d.) per lb., whilst 15 cents covers all expenses of shipment and duty, &c. Upwards of 5000 bales were shipped by the close of last year, worth at least 400,000 dollars.

The county of Otsego has for some years been reputed the most extensive hop-growing region in the state of New York. In 1854, the number of acres appropriated to the cultivation was 2,500, and it is estimated that 1000 acres more will be cultivated this year. Thus at the ratio of last year's product, 800 pounds to the acre, the crop of the present season will reach 2,800,000 lbs., which, at the ordinary current market value there, of about 20 cents, would realize 560,000 dollars. The cost of production is stated at 10 cents a pound.

In 1839, the annual amount of hops raised in Otsego was only 447,259 lbs.; in 1849, it was 1,132,052 lbs., being an increase of 684,802 lbs. in ten years. The hop product of that county last year, according to the report of the County Agricultural Society, was 2,000,000 lbs., being an increase of 867,948 lbs. in five years, and 1,552,750 lbs. in fifteen years.

The other principal hop-growing counties in the state of New York are Madison, Oneida, Cortland, Herkimer, and St. Lawrence. Madison raised in 1849, 529,070 lbs.; Oneida 294,944 lbs.; Herkimer 163,408 lbs.; and St. Lawrence 101,855 lbs.; whilst Otsego county raised nearly one half of the whole hop product of the State.

The price of hops is probably more fluctuating than that of any other agricultural product, yet an increase in the culture is being carried out in America, for the plain reason that the average price of hops for the last forty-eight years in the New England states having been about 13 cents per lb., has paid a greater profit than any other agricultural crop during the same period. A recent number of the *Boston Chronicle* states that 20,000 dollars worth of hops were delivered at the railroad station in St. Johnsburg, in one week, by farmers in that vicinity. They were contracted for at from 25 to 35 cents per pound. The value of the hop crop in Danville alone last year was 16,000 dollars. The growth of hops in the United States, by the census of 1853, was given at 31,000,000 lbs., which was less than one-third of the British growth last year, 9,877,126 lbs. having been charged with duty.

The quantity of land under cultivation in hops in Great Britain in 1834 was 56,273 acres, and the quantity of British hops exported 33,338 lbs. The amount of duty received for the remainder was £329,942, which gives the total produce—say, 27,305,506 lbs., or 243,797 cwts. consumed, and 297½ cwts. exported—together 244,094½ cwts., the

value of which, at 85s., exclusive of duty, was £1,025,199.—(Parl. Paper, No. 195, sess. 1835).

The number of statute acres under culture with hops in this country at various periods is shown in the following figures:—

1810.....	38,265 acres.
1820.....	50,048 „
1830.....	46,726 „
1840.....	44,805 „
1850.....	43,125 „
1854.....	53,823 „

The largest extent under culture with hops in the last fifty years was in 1837, namely, 56,323 acres. The highest average product was 13¼ cwts. per acre, in 1808; 6 or 7 cwts. per acre would however be about a general average, and the Americans have certainly not exceeded this growth, even if they have reached it as an average; there the culture is less carefully attended to, and less expensively carried on, either in the cost of land, manure, harvesting, or preparation.

The imports of foreign hops were 264 tons in 1849, and 324 tons in 1850, of which about a third was re-exported.

In 1853 we imported 42,344 cwts., of which 22,647 cwts. were entered for consumption. Of the supplies, 12,694 cwts. came from the Hanse towns, and 28,168 cwts. from Belgium. Last year we imported the increased quantity of 119,677½ cwts., of which 48,062 cwts. came from Holland and the Hanseatic towns, 48,934½ cwts. from Belgium, 3,419 cwts. from France, and 18,916 cwts. from the United States. Only 6,283 cwts. were re-exported; and on the 5th of January, there were 20,130¼ cwts. of foreign hops in bond.

The hop plant is cultivated to a considerable extent in Bavaria, particularly in the circles of Rezat, and the Upper Danube; the quantity raised varies from 30,000 to 40,000 cwt. a year, of which about half is exported. According to Berghaus the average annual amount of hops raised there is 34,900 centners, the centner being nearly equivalent to the hundred-weight.

The Bavarian hops have come to us chiefly through Hamburgh, and they are mostly sent into remote country districts, for retail dealers and publicans brewing on their own account.

On the Continent hops have been extensively cultivated, but never to perfection, the flowers having generally a rank smell and flavour. The plant has also been introduced into Canada, Van Diemen's Land, New Zealand, and on the Himalaya mountains, with various success. The hops shown at the Great Exhibition in 1851, from Canada, were reported by the judges to be the best that had ever been imported into this country, and had they less of the "currant leaf" flavour, they would fetch a good price in our market. Canada until within a few years past did not grow enough for her own consumption; she imported 37,653 lbs. in 1850, and 16,694 lbs. in 1851. The growth of hops in Canada in 1852 was but 224,222 lbs., and the frost frequently kills the roots of the plant. When the price is high here, it may answer to ship hops. 42,978 lbs. of hops were exported from Canada in 1848, 24,687 lbs. and 9 packs in 1849, 29,182 lbs. in 1850, 72,223 lbs. in 1851, 47,683 lbs. in 1852, 8,741 lbs. in 1853, and 165,868 lbs. in 1854.

Mr. Colman, in his continental tour, stated he noticed nothing peculiar in the management and culture of hops in Flanders, excepting the production of 1,600 lbs. of dried hops to the acre, which is a very productive yield. They are careful not to have the plantations of too large an extent, as it would prevent a free circulation of air: and they fertilize the ground most liberally with liquid manure. The hops are planted in hills, six feet apart each way, and four plants to each hill. A trench is dug round the hill, which is filled with decomposed manure, and in some small measure earthed up. The usual operation of trimming and poling them follows. As no crop of hops is taken the first year, the intervals are occupied by cabbages and other plants. In 1851, Belgium exhibited fair samples of several varieties, which ranked next to the Canadian in point of flavour. The Mayntz hops were also of good flavour and well harvested, though rather small.

A few years ago France had 827 hectares under culture with hops, the average produce being a little over one hectolitre, worth 1191¾ francs: the total value of the hops was stated at 1,000,000 francs.

THE MANURES FOR WHEAT.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

From the days of Jethro Tull, the question of growing wheat on the same land for a series of years has engaged the attention of many friends of agriculture. Of the *possibility* of the practice there is abundant evidence. In certain celebrated fields of the hundreds of Essex, and also near to Littlehampton in Sussex, and other places dispersed here and there throughout England, wheat has been annually grown for a long series of years on the same ground. In the soils of the New World, composed of deep accumulations of slowly decomposing organic matter, the same course of

cropping is successfully adopted. Of late years, some trials by Mr. Piper, of Colne, in Essex, have shown that this may be well accomplished with merely a careful hoeing and top dressing of the land, but without ploughing or other stirring. On the other hand, the Rev. J. Smith, on the clays of Lois Weedon, in Northamptonshire, has grown corn for a similar series of years by manuring and deeply stirring the land. In the last number of the Journal of the Royal Agricultural Society of England, there are two papers bearing on the same important research—both the more useful because their authors, during their practical enquiries, labour hard to render more clear the *chemistry* of the important object to be obtained; the one by Mr. J. B. Lawes, describing the valuable experiments of Mr. Kearey, of Holkham, on the growth of wheat on the same field for several years, and the other by my friend Professor Way, upon the sources of nitrogen in plants. The experiments of Mr. Kearey combined two important inquiries; they were directed, not only to show the *class of manures* the best adapted to restore to the soil the matters abstracted from it by a series of crops of wheat, but also *the period of the year* when such wheat dressings are the most advantageously applied. The result of Mr. Kearey's trials, and the lessons to be derived from them, to which I shall presently have occasion to refer, are thus cautiously summed up by their reporter:—

"What, then, is the lesson to practical farming which these experiments should teach us? It will not be supposed, that because it is here shown that in a cultivated soil of a comparatively light character an increased growth of wheat may be obtained over a continuous series of years by the use of nitrogenous manures alone, that hence rotation and home-manuring should be abandoned, and that corn crops should be grown continuously by means of nitrogenous artificial manures. There cannot, however, be a doubt of the legitimacy of the inference from these and other experiments, that provided the land receive in a course of years a due share of the home manures derived from feeding of horses and other stock on the farm, the mineral supplies of the soil will be amply sufficient to sustain an increased and even repeated growth of corn, by means of nitrogenous artificial manures, considerably beyond that which is recognised by the leases or the current practices of the day; and a further assurance that the necessary minerals are not likely to become deficient, under the judicious adoption of such an increased growth of corn, is to be found in the fact that there are few really large sources of nitrogenous manures which do not, at the same time, bring upon the land a considerable amount of some of the more important minerals also."

The experiments of Mr. Kearey were made in plots of half an acre each, upon the ordinary medium soils of Holkham, resting upon a substratum of marl. They were instituted (and they are still continuing) in the season of 1850-51, to ascertain —1. What would be the result of growing wheat for a series of years upon such light land without any manure whatever. 2. Manured with only certain mineral or saline manures. 3 and 4. With salts of ammonia, No. 3 having the salts applied in the *autumn* (as all the other dressings were), and No. 4 in the *spring*. 5. With a mixture of those mineral and ammoniacal salts. 6. With a vegetable manure (rape cake) only. 7. With farm-yard dung. The results obtained in the years 1851, 1852, 1853, and 1854, will be found in the following table, in which column 1 gives the manures annually applied per acre; 2 and 3 the total produce of dressed corn in bushels during the *four* years, and the straw in lbs. during the *three* last seasons; 4 and 5 give the average annual produce for the *four* years; and 5 and 6 the average annual produce, omitting the first year; the average straw, however, is always of the last three seasons.

	I.		II.	III.	IV.	V.	VI.
1	Unmanured	..	93	3894	23	1298	17
2	Sulphate of potash	300	91	5100	23	1700	19
	„ soda	200					
	„ magnesia	100					
	Super-phosphate of lime { Calcined bone-dust	200					
	Super-phosphate of lime { Sulphuric acid ..	150					
3	Sulphate of ammonia	200	125	6720	31	2240	27
	Muriate of ammonia	200					
4	Sulphate of ammonia	200	123	6728	31	2243	27
	Muriate of ammonia	200					
5	Sulphate of potash	300	145	8515	36	2838	32
	„ Soda	200					
	„ Magnesia	100					
	Super-phosphate of lime { Calcined bone-dust	200					
	Super-phosphate of lime { Sulphuric acid ..	150					
	Sulphate of ammonia	200					
	Muriate of ammonia	200					
6	Rape-cake	2000	147	8240	36	2747	31
7	Farm-yard dung (tons)	14	135	7819	33	2606	30

From these trials, which it will be seen have already extended over the seasons of 1851, '2, '3, and '4, more than one valuable conclusion may be derived. That the land was originally in good condition, may be seen from the fact that the produce of corn obtained in every case was more considerable by from 14 to 20 bushels in the first than in the average of the following years. The *unmanured* plot, it will be seen, yielded 39½ bushels of dressed corn the first year, 1851, 15½ in 1852, 21½ in 1853, and 16¾ in 1854, the average of the four years being 23¼ bushels, that of the last three about 18 bushels. The dressings with only saline manures in plot 2, did not help the produce materially; it was annually 34½ bushels, 19, 19¾, and 18½ bushels. The mineral manures alone were evidently, therefore, insufficient to keep up the productiveness of the soil. "In the next experiment," observes Mr. Lawes (Nos. 3 and 4), "the manures employed were the two salts of ammonia only, the only difference being that on No. 3 the dressing was applied in the autumn at the same time as the other manures of all the other plots, and on plot 4 they were top-dressed in the spring. Looking to the columns of *total* produce, we see that, taking the four years together, there is a difference of less than 2 bushels between the produce of the two plots, it being, however, rather in favour of the autumn-sown manure. The autumn-sown manure also gave on the average a rather better weight per bushel. The produce of straw, taking together the three last years (it not being weighed in the first), is nearly identical in the two cases, there being a difference only of 8lbs. in favour of the spring-sown manure. Upon the whole, then, the results are in favour of sowing these soluble manures in the autumn even in so light a soil. Comparing the produce of the different years by ammoniacal salts alone, we find that there is here again a fall in the produce of 18 bushels in the one case, and of 14½ in the other, from the first year to the average of the three last years; and that there is afterwards something like a gradual reduction from year to year. It is obvious, therefore, that the amount of nitrogen supplied in this large dose of ammoniacal salts is in excess over the annually available minerals of the soil, which it would appear are becoming gradually reduced. That these, however, are nevertheless considerably in excess over those required by the natural supplies of nitrogen, is obvious from the fact that whilst by mineral manures alone we got no increase of corn whatever, and only a total increase of straw in the last three years taken together of about half a ton, the ammoniacal salts alone have given in the four years a total increase of 31 to 32 bushels of corn, and in the three last years of 2830 lbs. of straw. By the comparison, then, of the results of the mineral manures alone by the side of those of the ammoniacal salts alone, we have beautifully illustrated, not only the nature of the characteristic exhaustion induced by the growth of the corn, but we are also able to form a pretty clear idea of the actual degree or extent of that exhaustion, much more so at any rate than we should be by any analysis of the soil.

"In experiment 5, we have in the manure both the minerals of plot 2, which gave no increase of corn, and but little increase of straw, and the ammoniacal salts of the plots 3 or 4, which gave a considerable, though annually decreasing, amount of increase. The result of this mixture of both minerals and ammoniacal salts is to give, taking the four years together, from 53 to 54 bushels of corn, and a large quantity of straw more than is yielded by the minerals alone. This, then, is an annual average of 13 to 14 bushels of corn and an equivalent of straw due to the ammoniacal salts. And since there is in the four years about 20 bushels more increase by the mixture of both minerals and ammonia salts than by the ammonia salts alone, it is obvious that the minerals of this last 20 bushels of the total 53 of increase were derived from the mineral manures employed."

From a careful review of these interesting researches, regarded in connection with the mineral substances naturally supplied by the soil, and the ammonia furnished from the atmosphere, Mr. Lawes is fairly led to the conclusion that these experiments tend to prove "that the soil, even with the most unusual and very exhausting process of carrying off the land the total grain and straw of several successive corn crops, after a root crop which had also been drawn from the land, still contained a larger annual available supply of minerals than the annual natural supplies of other constituents, nitrogen or carbon, were adequate to turn to account. That the excess of the annual supply of minerals in the soil over that required to appropriate the natural resources of nitrogen, is proved, by the effects of ammoniacal salts alone, to have been equal to the further growth, during four years, of about 32 bushels of wheat, or an average of about 8 bushels per annum. That beyond the increased annual produce which the supply of minerals in the soil was adequate annually to provide when nitrogen was not wanting, the average capabilities of the climate were competent for the manuring of a still greater produce, if additional minerals as well as the ammoniacal salts were provided; and in that case, from once and a half to twice as much corn was grown as the natural supplies of nitrogen, even with a most liberal supply of minerals, were sufficient to produce. That carbonaceous organic matters (such as are contained in rape-cake and

farm-yard dung) are of themselves of little or no effect in increasing the growth of wheat."

The very material power of ammonia, in promoting the growth of wheat by furnishing the requisite supply of nitrogen, so well illustrated by the experiments of Mr. Kearey, naturally leads us to the consideration of the mode by which plants usually furnish themselves with that supply of nitrogen, and this great question is well discussed by Professor Way (*Jour. Royal Ag. Soc.*, vol. xvi., p. 249), in a paper which, I venture to predict, will be the groundwork from which still more valuable truths will be hereafter elicited, and new views of several ancient and modern systems of cultivation obtained. I do not propose on this occasion to dwell at much length on this important inquiry; it is to that portion only of the Professor's paper which incidentally illustrates the use of green manures that I shall now confine myself. He tells us (p. 253) that some years since, "Boussingault, whose name is familiar to every student of agricultural chemistry, attempted to settle the question whence and under what form plants obtain their nitrogen. Aware of the difficulties and sources of error to which the experiments of Saussure were exposed, Boussingault employed another and very simple method to ascertain whether plants could obtain their nitrogen from the air, namely, to compare the composition of the seeds with that of the crops produced from them, solely at the expense of the air and water. The great exactness with which the determination of nitrogen could be made, would of course enable him to ascertain with certainty whether the crops contained a larger quantity of this element than the seeds from which they were produced.

"Seeds, of which the weight was previously ascertained, were sown in burnt clay or in silicious sand, from which all traces of organic matter and ammoniacal salts had been removed by perfect calcination. Porcelain pots were used to contain the soils, and the growing plants were placed in a greenhouse at the end of a long garden, and watered with distilled water. If under these circumstances the quantity of nitrogen in the crop was larger than that furnished by the seeds, the inference was incontestable that the plants had imbibed nitrogen from the air in some form.

"The plants upon which these experiments were made, were clover, wheat, oats, and peas. The conclusions to which he arrived from these experiments were that wheat and oats, although increasing in weight from an assimilation of hydrogen, carbon, and oxygen, did not sensibly increase in the proportion of nitrogen; that, on the other hand, *the leguminous plants, clover, and peas, had sensibly acquired nitrogen during the experiment.*"

These important observations of M. Boussingault, if verified by further and more extended experiments, will very probably lead, amongst several other things, to a better understanding of the uses of green crops, and to the practice, much more common in some continental states than in England, of using such crops merely as manures. And it is noticeable that tares and red clover, which were found by M. Boussingault to increase their amount of nitrogen from atmospheric sources alone, are perhaps the two crops which, when ploughed in their growing state into the soil, are the most generally known in this country for their beneficial effect upon the succeeding wheat crop; and, again, we know that lupins have been grown from the days of Varro by the Italian farmers, for the sole purpose of being plonghed when green into the soil; and as buckwheat and coleseed are also occasionally used in a similar way in the east of England, this naturally will lead us to consider whether these plants also, and perhaps many others, especially those which flourish on poor soils, do not possess the power of deriving their nitrogen, not from the soil, or from ammonia only, but from the nitrogen gas of the atmosphere, which, although the most considerable in amount of the free gases, yet whose uses we have been hitherto led to regard as the least understood.

All these valuable glimpses, as it were, of still unknown truths, may well prompt us to continue our exertions after knowledge; they serve to assure us that, as we now grow crops and support herds and flocks such as our forefathers deemed utterly impossible, so those who are now commencing the cultivation of the soil, and those who succeed them, will produce still larger, still more certain harvests than ours. Other Bakewells, Collings, Culleys, and Jonas Webbs will appear amongst breeders; still more ingenious Ransomes, Tuxfords, Garretts, and Barretts among mechanics; new Davys, Johnstons, Leibigs, and Ways amongst the chemists; whilst amid succeeding generations of clear-headed, far seeing practical farmers, a fresh legion of Hudsons, Hutleys, and Thomas's, will continue to separate the grain from the chaff of other sciences, and will in their turn leave to their successors the following on in the great paths of agricultural improvement, which time will hardly ever exhaust.

A HINT FOR FARMERS.—BLASTED CORN.—Mr. Alexander Maurice, Feuar, Turniff, was, the other day, taking a look at his growing corn, and observing a great many black or blasted heads, and wondering to himself what could be the cause of it—whether it was from atmospheric action, or from the grub-worm—he pulled a stalk very carefully, and found, firmly attached to the root, what he considered a grub-worm enveloped in a sack, or covering. The grub was three-fourths of an inch long, and striped, and of a brownish colour.

THE PRODUCTION OF GREEN CROPS.

The production of green crops for foddering with cattle and sheep forms an important item in farm management, although it has not received that consideration that we conceive it has deserved. In our opinion, crops of this description ought to obtain the utmost attention upon the part of the farmer, and should not be treated as secondary, or as merely preparatory for the cereal crops; for although they will, to a certain extent, necessarily be so considered, we hold that if land is duly prepared and manured for their production, double or even triple the number of cattle may be maintained from the same extent of land, as are now supported by the ordinary processes.

The custom of feeding the clovers and artificial grasses with sheep will continue to prevail upon all soils of a poor description, and lying distant from the homestalls, it is the only method of renovating them at the cheapest rate; but wherever land of a fertile character is found, then we hold there will be great waste by devoting it to feeding with cattle or sheep in the ordinary way, as by continually biting down the stems, and keeping the surface exposed, the amount of produce will become greatly diminished over and above what might have been obtained by mowing it at regular intervals, and foddering the produce in yards and under covered buildings, with cattle, horses, and sheep, upon the improved system. So far as experiments have been made, we have ascertained that with red clover, the number of horses usually kept by feeding may be quadrupled, in suitable seasons, by feeding them as before stated. In one particular instance in our recollection, 20 acres of red clover produced upwards of four tons of marketable hay, and which actually realized £365 upon the spot. The actual feeding value of this would not have been estimated at more than £60, and adding £25 more for expenses, leaves £280 as increased profit by thus converting it into hay; and if we assume that it would have required four tons of green clover to have produced one ton of hay, we obtain sixteen tons per acre as the result, which shows the vast advantage that might be thus obtained by the system of foddering it in its green state over that of feeding it upon the land, as practised by the majority of farmers. But when we investigate still further, and take into consideration the large quantity of manure that may be produced under the foddering system, and place it at a fair value, we are enabled to state that the advantage so to be obtained will far exceed our ordinary estimate; that there is in no case in which manure had been liberally bestowed for the production of green crops, in which it has not been amply repaid by the system of foddering, so as fully to become a self-maintaining principle in management, and therefore worthy of our utmost consideration.

Some experiments have been made this summer with Italian ryegrass: the land upon which it was designed to be sown was cleaned and brought into excellent tillage by the 1st of May, and the Italian ryegrass sown, which, owing to the dryness of the season, did not at once vegetate. It is, however, now ready for cutting, many of the seed stems being already upwards of five feet in length; and, in the event of a moist autumn, it is thought it will afford another cutting. And it must be recollected that this production is entirely the result of ordinary farm management, and is mentioned for the purpose of exhibiting the value of this grass when devoted entirely as a crop for the purpose of foddering, and not, as in the usual way, by sowing it in conjunction with grain crops, when it is liable to exhaust itself in the first season, or to become injured by the crops of grain becoming lodged, or otherwise excluding the light and air in its growing state; whilst, upon the other hand, it frequently retards the harvesting of the grain crop with which it is grown, to a serious extent.

In our opinion, the proper time for sowing Italian rye-grass is between the 20th of July and the 1st of August; and if the land is duly prepared and manured, exactly as for turnips, it will be found to yield such produce in the following year as fully to repay the increased expense of the process. Cultivated in this manner, it has reached the height of seven feet by the middle of the ensuing May, after having been slightly fed down before Christmas with sheep in the preceding year.

In the cases mentioned arising out of the discussions of the London Central Farmers' Club, of the amount produced in one season by Mr. Telfer, Mr. Dickenson, and others, it must be recollected that the amazing quantity stated to have been produced by successive cuttings in one season by them was the result of a very bountiful application of guano in addition to the manure of a large number of cows, and applied in a liquid state, by incorporating those substances with a still larger quantity of water, and applying it to the surface betwixt each cutting; but by the mode we recommend, the result is to be obtained by the ordinary processes of farming;

and if well carried out, a few acres so annually devoted will support a large quantity of stock; nor is it advisable that it should remain more than one summer in full cultivation, as it will be found so to exhaust itself as not to afford a crop sufficient in the ensuing year to compensate the difference of cost by restoring it in sufficient quantity by the preparation of another portion of land by way of succession.

The cultivation of the common tare is more usually resorted to, as the plant adapted for foddering purposes; and valuable as it may be in dry seasons, it is of little value comparatively during moist ones, as food for horses; and if experiments are made with it by way of comparison with clover or Italian rye-grass, we have no hesitation in stating that horses kept upon it, with an allowance of oats to the extent of one bushel per week, will not maintain their condition equally with horses kept upon the latter without any oats whatever; and, as to after-results, the clover stands decidedly first, and the tare second, as a preparatory crop; whilst the Italian rye grass will be found, in the words of Tusser, to be a "peeler of ground," or, in other words, to have exhausted the soil to such an extent as not to allow a wheat crop to be taken in the next year with any probability of success. Peas, beans, or oats may, however, be substituted in its place with profitable result.

The raising a large quantity of manure upon a farm is the foundation of good management; and our fallows have been especially devoted to the production of root crops to facilitate that object, but we have never directed our attention to the exclusive production of green crops for summer foddering, always viewing them as subsidiary to, and preparatory for, the production of the ensuing grain crops. Still we are convinced that, valuable as any winter root crops may be considered, summer crops will be found equally so, and that their production ought to obtain the attention of the cultivator exclusively on their own account, and independent of other considerations, beyond their own value as foddering crops. Exhausting crops, in the present age, ought to be considered as "extinct species," now that we have guano and artificial manures in such abundance as to enable us to restore any soil to its original degree of fertility by a single application.

AGRICULTURAL STATISTICS.

To those who have already given any attention to the question of Agricultural Statistics there is in reality but little new matter in the evidence lately taken before the Lords' Committee. The means by which Mr. Hall Maxwell and the Highland Society accomplished so much are well known to most of our readers. How our own plan here in England of trusting the business to the different Boards of Guardians resulted anything but as satisfactory, is as apparent from the reports of Sir John Walsham, Mr. Hawley, Mr. Pigott, and other gentlemen who undertook to superintend the collection. The opinions and advice of Mr. Caird on this matter—by far the best and fairest thing Mr. Caird ever did as an "agricultural teacher"—have for some time been disseminated. The same may be said of the more theoretical views of Mr. Leone Levi; while Mr. Buckland had published his pamphlets and Mr. Sandars written his letters long before this Committee was ever appointed.

We repeat, then, there is nothing very novel to be found here. As far, indeed, as the experiment has been tried, the details have been anticipated by the other Blue Book, issued in the spring of this year. That which Sir John Walsham, Mr. Hawley, and their associates furnished in their reports then, they give again in their evidence now. Still the Lords' Committee could scarcely have acted otherwise than they have done. Their duty was "to inquire into the best mode of obtaining accurate agricultural statistics from all parts of the United Kingdom;" and in pursuance of this they took the opinion of any one like an authority on the subject before them. The only question with us is, whether they went quite far enough into this inquiry. To be sure, the advantage of collecting these statistics must have been something of a foregone conclusion: still the fact of there being difficulties in the way of obtaining them must have been equally manifest. The effort had, in England at least, been so far a failure. It broke down partly from the employment of inefficient machinery, and partly from the disinclination of the farmers to furnish the returns. The natural question which arises here is,—What are these objections? and how are they to be met and overcome? The several supervisors report rather generally on the opposition they encountered. It would surely have been more satisfactory to have had a few of these dissentients themselves up before the Committee, and to have heard all they could possibly urge against the measure. We believe, moreover, that such a course would have tended beyond anything else to convince them no harm nor injustice was intended them.

As it is, they have been altogether unheard. Considering, indeed, that this is a committee appointed to report on a matter of especial interest to the agriculturist, we cannot say that he is very strongly represented in that evidence upon which such a report would necessarily have to be grounded. Amongst the many supervisors, commissioners, and amateur advisers called in, we find a very small tithe of witnesses practically engaged in the pursuits of agriculture. Perhaps the best known amongst them is Mr. William Torr, from Lincolnshire; while with him we have associated Mr. John Peirson and Mr. William Rodwell, gentlemen who both farm to some extent in Suffolk. It is but fair, however, to say that Mr. Peirson farms his own property; so that, after all, he may rather be classed with Mr. Miles, the president of the Royal Agricultural Society, whose testimony can still only be taken as that of a landowner.

Here, we confess, it strikes us is the weak place in the work of the House of Lords' Committee. When their report and evidence first reached us we turned rather anxiously to see what the farmers themselves had to say on the subject. We were surprised to find them say so little. Valuable as it is, we could in some degree anticipate what would be the testimony of Mr. Maxwell, Mr. Caird, Mr. Hawley, and others, for their experience and their opinions were already before us. On the other hand, the agricultural feeling had been anything but as clearly expressed. At best the different commissioners could but record it as vague and contradictory—great success and support in this Union and none in the next—or more general dissent, as happened to Mr. Hawley in some parts of Hampshire. Surely it would have been better to have had some of these Hampshire gentlemen up, to explain what ills they saw must follow their telling how much land they had in crop, or how many head of cattle they had upon their holdings. We believe with the Lords' Committee that "the absence of information on the subject is found to be productive of inconvenience and injury to all classes, and to none more than to the agricultural interests themselves." At the same time we would certainly have allowed both sides the opportunity of saying what they hoped or feared from the establishment of such a system.

The four gentlemen we have named, as here representing more especially the whole body of agriculturists, are all decidedly in favour of the measure in contemplation. Mr. Miles, the late President of the Royal Agricultural Society, recommends to a Committee on which his successor Lord Portman is sitting, "that a bill should be passed as rapidly as possible, rendering the return of agricultural statistics compulsory." Mr. Torr is sure that "in Lincolnshire the farmers would object to make a return of the actual quantity they had grown in any particular year, and that all you can expect from them is the number of acres under a given crop, and a general statement whether they consider it to be a fair average;" while he feels that, at least in the first instance, even to obtain this much the measure must "be compulsory." Mr. Peirson thinks these returns, both of crop and stock, "would be of great advantage to the Suffolk farmer;" while, referring to the late experiment, "if we had had compulsory powers, we should have had no difficulty in obtaining this information." And Mr. Rodwell states the principal reason for the late failure, "as far as my own observation went, to be this—that while one man was quite willing to make the return, he found his neighbour unwilling to do so. They feel that they all ought to make the returns; and I do not think any scheme will be effectual unless it be rendered obligatory."

The committee in their report agree very much with all this, supported as it is by evidence of a similar tendency from other quarters. With Mr. Miles they say "that it is desirable that the Government should introduce a bill into Parliament as early as possible, for carrying into effect" all they recommend. With Mr. Torr they agree that "two classes should be annually obtained, the first containing facts, and the second estimates; and that the facts should consist of returns of live stock, and the acreage under each description of crop, while the estimates should consist of estimates of the produce of the harvest." The facts, however, are the mainstay of the whole process. As Mr. Caird well puts it, "the first point to be ascertained is the acreage under each different crop, and this is by far the most important part of the inquiry." The committee further agree with every witness, we believe, they called before them, in thinking "that it is expedient that powers should be given by Act of Parliament to compel the occupiers of land to make the necessary returns, in case of their neglect or refusal to do so."

There is very little doubt but that this report will be pretty generally acted on, and that the collection of Agricultural Statistics will now be prosecuted with far more vigour than it hitherto has been. In Scotland the matter is still to be left in the hands of the Highland Society. In Ireland the Government is recommended to continue to superintend the collection through the agency of the Constabulary; and in England we are to depend on the Board of Trade and our Poor-law machinery. The great difficulty after all is with England, and we may return again to the means to be employed to meet it.

AGRICULTURE IN THE LAKE DISTRICTS.

Those of our readers who, in their return from the Carlisle meeting, paid a visit to "the Lake district" of Cumberland and Westmoreland, would notice the primitive character of some portions of its agriculture: the more upland farms, especially, being *conducted* on a very simple system—we cannot say *cultivated*, for of cultivation on these sometimes extensive farms there is little or none. They occupy almost entirely the sides of considerable mountains; and their stock consists almost exclusively of numerous flocks of a small, compact, and active breed of mountain sheep, whose mutton is peculiarly sweet and good. These hardy animals are found dispersed amongst the rocks, to the greatest elevations. We found them on the very summits of Skiddaw (3,022 feet above the sea), and on Scawfell (3,166 feet), the highest ground in England. When we saw them, in the early part of the present month, the herbage was, even at these heights, abundant for their support. They were in fair condition; and, true to the character of all sheep, were evidently preferring the highest elevations. It is not, then, for their summer keep that any difficulty is experienced; but their winter support is the great source of their owners' anxiety. They are out on these hills the whole year, at elevations so considerable that the pastures are snow-clad for much more extended periods than in lower or more southerly situated grounds. In such trying periods, the sheep of the Lake district have to procure a scanty subsistence as well as they can; and yet it is only in very continued and deep snows that the owner gives them a small portion of hay, grown in the little productive meadows which here and there nestle, as it were, by the side of the bright and sparkling streams which are found amid all these mountains, or in rather broader strips by the side of the lakes, for which this beautiful district is so justly celebrated. This hay (generally of excellent quality, too) was gathering in during the early part of September, which is their chief hay season, and is stored in barns—since they have in most of these hill farms no straw with which to thatch hay-stacks, or cereals to fill their barns. The result of this absence of corn, of course, is not advantageous to the appearance of the homestead, which commonly looks empty, and devoid of farm-buildings and live stock. A cow or two, and a few pigs (all in good condition), with sometimes a pair of strong and active horses, are, in fact, the only stock besides the sheep which tenant these farms. There are hardly any roots grown; or if any are found, they are in patches of an acre of swedes, or in an acre of carrots, or now and then a piece of mangel. Of wheat, here and there a strip of similar extent is commonly seen, looking cold, backward, and full of weeds—amongst which the wild persecaria occupies a prominent position, and grows luxuriantly. Oats are their chief cereal, and are fine, with bright-coloured straw, and are best adapted to the moist climate of these hills; they are now (Sept. 11) in the middle of harvest. The rain-fall of this district, we must remember, is by far the greatest of our island; and for this excess of moisture it is not difficult to account: a series of south-westerly and westerly breezes waft to the foot of these considerable hills the soft air of the Atlantic, surcharged with the watery vapours of the warm Gulf-stream—currents of air whose temperature is retained as long as they sail over the warm level surface of the Irish Channel or the low lands of Ireland and Lancashire; but on arriving at these hills, the current of air is directed upwards, and, mingling with a more elevated and far colder atmosphere, an immediate condensation of course takes place; masses of fleecy clouds make their appearance; and showers of rain occur, rivalling those of Hindostan in amount and duration. The average annual rainfall at Whitehaven, at the foot of these great upheavings of Nature, is equal to about 46 inches, or nearly double that of the neighbourhood of London. But throughout the hills the fall, according to the observations of Dr. Miller, is more than double that of Whitehaven; and in some places nearly treble.

Having, then, to contend with such a climate and such pasture, we may readily account for the small size of their mountain sheep, the absence of any extent of cereal crops, or of roots. But when we thus make allowance for the natural difficulties with which these athletic hill-farmers of the north-west have to encounter, we are not so well assured of the difficulty of *improving* their management. We see here a climate admirably adapted to the cultivation of roots: the luxuriant growth of furze, fern, and other indigenous plants in many places on their hill sides, tells us very plainly that better crops than these may be produced, and profitably too, in many places; crops which would aid the flockowner to a much greater extent than any he now possesses. Then, again, we see too little attention paid in this district to the choice of early varieties of oats; a subject which has long engaged the attention of the hill-farmers of Scotland. Indeed, the selection and trial of seed-corn might well be

extended to other parts of England than those upon which we have been dwelling; and this experimental search after better and earlier-ripening varieties of seed-corn should not, we think, be confined to the selection of peculiarly fine or marked varieties from chance-grown ears—much as we approve of such a course—but should be extended to seed selected from other countries than our own, and from colder climates. Care, however, must here be had not to select seeds from lands the mean temperature of whose *summers* far exceeds that of our own, and whose summer-days are so much longer than those of England, since here the heat and light of their long-ripening days excite the corn-plant to a rapidity of growth which our more temperate seasons would not be likely to produce. We would rather search for seed-corn in colder and more humid climates than our own. We would try the seed oats, for instance, ripened upon the most elevated hills of Scotland, and upon their eastern or northern slopes, or those of Prussia or Pomerania.

It is well known that certain plants and seeds vegetate in a much lower temperature than others. The honeysuckle, the alder, and the Siberian crab, for instance, amongst shrubs, the chickweed amongst our weeds, are, we all know, vegetating in our gardens before other plants are making the smallest movement. Certain varieties of oats have been found by the Scotch farmer to ripen their seeds a fortnight or more sooner than other seed oats sown in the same field, the same soil, and on the same day. Similar remarks have been made with different kinds of barley and wheat.

But again we ask, are not much more considerable things to be accomplished in this way—and we feel that as we are now so close upon one great seed-time we can hardly offer the suggestion at a more opportune period? We are all aware how susceptible to the effects of warmth *plants* become, which have been long exposed to extreme low temperature—how rapidly they grow in a temperature in which plants of the same kind from a warm climate will not even begin to vegetate. Have any of our readers noticed the result of exposing the seeds of spring corn to a low temperature? for instance, by spreading them thinly on a dry floor, or enclosed in cases in an ice-house? Is *their* susceptibility, their impatience of warmth increased after being kept in a low temperature for some months? We confess to sundry doubts; but still we think good results might arise from carefully-conducted experiments.

THE IMPORT AND EXPORT ITEMS IN FARMERS' ACCOUNTS.

However people may differ in opinion as to the public utility of agricultural statistics, there is one branch of the subject universally allowed to be important to every farmer, and yet strangely neglected or misunderstood: we mean the imports and exports, profit and loss, of individual farms, exhibited in what are called accounts.

Agriculturists have been blamed for not keeping as accurate a record of their business transactions, and of the state and prospects of their respective investments, as manufacturers and commercial firms are found to do. Now, while admitting that book-keeping is too much neglected among us, we consider that, from the nature of our occupation, the profit or loss of each branch of the business, the returns from different crops or management, cannot be ascertained like corresponding items in the affairs of a factory.

The essence of all account-keeping is the recording of all that goes out and all that comes in, whether goods, cash, or difference in value of stock in hand; and when a certain price is paid for a certain quantity of raw material, a known amount of money is expended in its conversion into articles for sale, and the market value of those manufactured goods is ascertained, there is no difficulty in following out the principle. But how can the farmer measure, weigh, or value the raw materials annually received into his fields, or open-air food-factories? Changes in the active or dormant condition of the constituents of the soil; the communication of subtle gases from the atmosphere; the conveyance of enriching matters in rains and springs; the agencies, physical, chemical, vital, which are actively and ever-variably at work in earth and air, in plants and animals—all these affect the rate of productiveness of his farm, and are raw materials, worked up into meat and bread without the possibility of being valued and set down in the day-book. We certainly have heard a peppermint-grower value the damages of an unlucky shower at so much per acre; but no man ever pretended to analyze and determine the precise increase or diminution of fertility in his ground from year to year, arising from different crops, different seasons, variations in tillage, and so on. Nobody institutes a strict analysis of every atom of manure left by his crops, allowing for escaped ammonia, wasted salts, &c., and would be little the wiser if he did. In fact, the naturally-imported

elements of fertility in our land are beyond our grasp; and, being unable to measure and value these, we are in want of the very first necessity in book-keeping: we cannot ascertain what is our stock of material in hand.

The farmer, then, must be content to keep as good an account as he can of cash expended and received, value at certain periods such kinds of stock as it is possible to buy or sell, and leave the improving or deteriorating condition of his farm—the bank in which he is either funding or overdrawing—to be discovered only in the slow course of years.

Farm-accounts, being thus *necessarily subject to incompleteness*, have proved more than a match for the best masters of single and double entry, and, we believe, will much impede all attempts at simplification and accuracy until the above view shall be taken into consideration, and the farmer always expect uncertainty to attend inquiry into the state of his finances.

Giving up, then, all hopes of strictly accurate book-keeping, we should take as full an account of all cash receipts and expenditure as we find compatible with the other engagements of our business; trusting that, as one year does not commonly vary very widely from another, we shall find the respective absorbings and returns of capital by the soil compensating each other in certain cycles of years, and informing us by results, in the long run, of our prosperity or of our failure.

Many farmers manage to transact business with no book-keeping whatever; many more are accustomed to set down a few rough memoranda, which will yield a gross account of the general receipt and payment: but surely men engaged in agriculture, no less than in other pursuits, if irregular in their accounts must be supposed by the prudent part of the world to be in a dangerous situation. Experimental farming, and even the ideas more or less detailed which we meet in conversation, must depend for their justness very much on accuracy of accounts; for a supposition deduced from general observation on a farm, and only generally conceived, must fall exceedingly short of a conclusion from regular details and exact accounts. The general fact is admitted; and though accounts are becoming more common, no one can say *how* they should be framed and kept in order, to show the required order of results. Unfortunately, they are often kept in such a manner as to prove rather the means of fortifying prejudices than of removing errors. Questions of nicety, where the contrasts are not exceedingly strong, relative to the comparative profit of different soils, of different rotations, of different applications of the same soil, or of different modes of culture, depend entirely on accounts. Keep your books in the method of one man, grass is more profitable than arable; keep them in another manner, and the contrary shall be the result. Many of these variations in system arise from the difficulty we have pointed out in the way of obtaining perfectly correct accounts. It is hard to say what things we shall take note of, and what we should rather set aside as out of our power properly to value. There are general distinctions that must everywhere be kept up; and there are also many minutiæ that must be sacrificed, in order to render the account tolerably easy to keep without an attention which a man in an active line of life cannot give. To keep to this medium is the great difficulty.

The nature of the farm itself will modify the system of accounts; hence the inconvenience of having a great number of little fields, or of sowing parts of one field with a variety of different crops, all this rendering the book-keeping more complex and laborious. It may be sufficient for some purposes to throw all the wheat, oats, and turnips, into so many separate classes, without particularizing each field; but a farmer who is continually applying new manures, or varying his tillage by means of improved implements, trying a change in his rotation, taking an occasional crop, and so on, ought to possess some better means than mere guessing, of knowing which plan pays best. For instance, what preparation for wheat has answered best? If all the corn is huddled into barns or stacks without distinction as to the field it came from, and is accounted for only in the gross in his "wheat-book," how can the question be answered? The guesses commonly made of probable produce are often egregiously falsified by the test of a bushel measure; and it is only by taking pains with our accounts that we can expect agricultural practice to be pushed on with any certainty towards perfection.

STEAM CULTURE.

"Specification of James Boydell: apparatus applied to the wheels of carriages to form railway—No. 431; A. D. 1854, price ninepence."

"This invention," says Mr. Boydell, in his provisional specification, "relates to improvements in apparatus applied to the wheels of carriages, for which letters patent were granted to me on the twenty-ninth day of August, 1846, which consists in the application of moveable detached parts of a railway to the wheels of carriages, whereby each part is successively placed by

its wheel on to the road or land over which the carriage travelled" (or rather is to travel); "each part of the portable railway, when down, allowing its wheel to roll over it, the wheel depositing and lifting the parts of the railway in succession; and my present improvements consist in the application of side pieces to each portion of the moveable rails, so as to obtain a more extended bearing for the rails whilst the wheel is passing over it; and the invention also consists in the construction of the parts of the portable rails by combining trough iron and wood, to obtain great strength with lightness."

An illustrated description of the "Endless Railway" having been given in the *Mark Lane Express* of Dec. 18th, 1854, it will be unnecessary to do more at present than to refer to what we there said on this head.

Boydell's proposition, it will thus be seen, is not, properly speaking, steam culture, but a peculiar method of fixing rails upon the periphery of wheels, so as to enable steam engines to do so. When we come to examine Hoskyns's, Romaine's, and Usher's propositions, we shall find that one of their greatest difficulties is to prevent the wheels of their carriages sinking in the soil, and thus bringing them to a premature stand. This Boydell removes by his "endless railway," applicable to all kinds of wheels. In short, his proposition is to enable steam to supplant horses as a motive power for all agricultural purposes. With so many thousand miles of railway in operation, and with such an immense amount of traffic in goods and passengers, it would be superfluous to offer proof as to the advantages thus enjoyed by our manufacturing and commercial interests. How far short would all the horses now engaged in British agriculture fall, of being able to perform the amount of work annually done here! And what reason have we to suppose that the "endless railway" will not confer similar advantages on agriculture?

The expense of horses to British agriculture falls little if anything short of £50,000,000 annually! Now when steam supplants horses, it will just amount to an increase of bread, corn, butchermeat, and dairy produce to the same amount annually! while the money spent in constructing and working steam engines and machinery under the system contemplated would go to support a higher branch of labour than the rearing and feeding of horses, thus elevating the social circumstances of the country. Between these two systems the political economist, as well as the farmer, will find a wide field for investigation—one exhibiting advantages in favour of steam which even the most enthusiastic advocate of progress will hardly credit. On the contrary, any proposition which does not contemplate the realization of these advantages, or the carting as well as the ploughing, must eventually prove a failure, as we on a former occasion shewed, the number of horses necessary to perform the work of carting on a farm in harvest being generally sufficient to do the work of cultivation during the rest of the year. Now no firm will support an expensive engine and engineer in the field, as both of necessity must be, and for every engine some eight horses in the stable, "eating off their own heads," as all horses soon do when allowed to stand idle.

Boydell's proposition is the first, and up to this date the only one, which contemplates the important revolution we have just noticed, and therefore the only one entitled to countenance from the practical farmer. This is no doubt giving the patentee his full meed of praise, while it is saying little in behalf of the others. But here it must be observed that his is only an auxiliary to theirs—endless railways to their wheels, so as to enable them to enter the field successfully without horses, and even at all; for hitherto they have failed, without an exception, and with all the horses, too, they could bring to their assistance. In short, his proposition without theirs would just be as great a failure as their propositions have proved without his.

The endless railway has been successfully applied to the wheels of barrows, carts, waggons, gun carriages, and a portable engine, converting it into a traction engine for field operations, as the common railway engine is a traction engine on rails. Numerous experiments performed before the Board of Ordnance and the highest engineering authority in the land, and also in our presence, bear witness to the truth of this, placing the general adoption of the principle of the invention ultimately beyond a doubt, for all agricultural and military purposes, thus conferring upon those two branches of national industry all the advantages of steam and railway progress. At no period in her history has England had more occasion to be thankful to the mechanical ingenuity of her people than she has at present to Mr. Boydell, reward him as she may for his labours. At war with Russia, the "endless railway" will enable her to bring her heaviest guns to bear upon the casemated fortifications of the enemy beyond the reach of her naval operations, as at Tiflis, Simferopol, Kherson, Nicolaief, Warsaw, &c., should such be necessary to bring him to terms; while in the roadless solitude of our immense colonial empire it will enable the pioneering arm of our surplus population to convey a sufficiency of breadcorn to their railroads, rivers, and sea-board, to supply the wants of the mother country. Those who cannot comprehend the position which we have thus shown that England now occupies, cannot distinguish between a great question and a small one, when both are placed before them.

Applied to the wheels of carts, waggons, and gun carriages, it facilitates draught in the same manner as the common railroad, enabling a horse or traction engine to draw a greater load after it, while it does not cut and injure the soil as such vehicles do without it. There is here a two-fold saving—*first*, of horse or steam power; and *second*, of the poaching of the land by the feet of horses, less than half the number being required, and also by the less cutting of the wheels. In both these cases the truth of our proposition has been much more severely tested by the engineering authorities of Government, than of the Royal Agricultural Society at Carlisle, and in every case with the most satisfactory results: hence the adoption of the endless railway by Government for the public service; this firm having already supplied the War Office with several large orders, some of the carriages which we

saw at Woolwich being capable of conveying guns of seven ton weight and upwards, over any surface where horses can travel. That this is an immense triumph in military affairs, no one can doubt, who has any experience in the conveyance of heavy-siege guns, and the material for their operations. In agriculture also there has been an increasing demand, the endless railway being now in operation in almost every province of the kingdom; but the progress made is hardly in accordance with the wants of the farmer, especially on clay soils where horses' feet and cart wheels do so much harm, as also in carting off turnips in wet weather generally.

Applied to the wheels of the portable engine, the endless railway converts it into a traction engine, as on the common railway, enabling it not only to propel itself to the field or any part of the farm, and do work there as a stationary engine in ploughing, thrashing, pumping liquid manure, sawing timber, making bricks and drain tiles, &c., &c.; but also of drawing heavy waggon-loads after it home, as the produce of harvest—ploughs, harrows, drills, rotary cultivators of every grade, siege guns with their carriages; in short, of entirely supplanting horses for all agricultural and military purposes. Such is Boydell's proposition; and doubtless it is a great one, requiring a little time to overcome all the prejudices which it may expect to meet in the agricultural and military worlds. Fortunately for him the two are divided, the War Office having ordered two of his traction engines for the public service, while some of our pseudo-agricultural teachers have concluded traction engines for agricultural purposes a failure.

There is nothing extraordinary in this. To opinionative writers incapable of calculating mechanical results from mechanical data few novelties were perhaps more calculated to elicit misgivings than the application of the "endless railway" to a common portable engine as exhibited at Carlisle; but steam and the rail have long since triumphed over greater obstacles than these, and may do so again; for we once heard a very learned professor (an LL.D.), in the class-room of one of our universities, unceremoniously rank both among the "useless machines" of the college museum; but fortunately he was spared to arrive at the opposite conclusion, and so may the writers in question. What novelty is it which has not met with the unflinching opposition of some farmers when first introduced, from the winnowing machine in the North to the traction engine at Carlisle?

With the construction of this traction engine, exhibited at Carlisle and at the exhibition of the Yorkshire Society, our readers must be familiar. On the 28th of May last a short notice of it appeared in the *Mark Lane Express* from our pen. At Carlisle, when put upon the brake, the dynamometer indicated that at "a pressure of 53lbs." the engine had a power of 14⅛ horses. The application of this power is far from judicious; nevertheless its application to the top of the wheel is mechanically correct, although the contrary was asserted by some of its opponents. The large wheels of the engine, our readers will recollect, are 6 feet in diameter. On one of these a 96-toothed wheel, 5 feet in diameter, is fixed; and on the top of this a small 8-toothed pinion on the end of the crank-shaft works, giving motion to the large wheels, carrying their endless rails. The stroke of the engines is greater than the diameter of the small pinion, so that in driving it the steam has a mechanical advantage; but, setting aside this, the lever power of the large wheel itself, acting as a roller on a hard surface, is 5½ feet! This, it will be perceived, is double the leverage of engines on our common railroads, if not more, from the objectionable manner power is there applied; and, as this leverage may be increased by increasing the height of the wheels, it is difficult to conceive what resistance the traction force of such a combination may not overcome, if applied in accordance with mechanical science.

Our readers are aware that the principle of transport here involved is one with the practice of which daily experience is familiar. The granite pedestal of the equestrian statue of Peter the Great, at St. Petersbugh, 1,217 tons in weight, on rollers by means of a capstan, is perhaps the first deserving of notice. All pulley work furnishes another class of examples. The unloading of beer casks into cellars, or *vice versâ*, sugar casks, &c., by means of a rope, is a third. The rolling of heavy trees up an inclined plane, or planks in loading timber, is an example of this latter kind with which every farmer must be familiar. In all these cases the lever power is always the diameter of the rolling body, so to speak, when rotating on a hard surface. A fourth class comprises carriage and cart wheels; but here the power being applied to the centre or axle, the leverage is only radius.

Altogether it is rather instructive to glance at the anomalous conclusions of the press as the arbiter of public opinion at Carlisle—*one* reporter affirming that thirty men held Boydell's engine fast with a rope; a *second*, that the engine broke the rope and ran off at a gallop; a *third*, that it strode with ease over irregularities, but, in the absence of such inequalities, was useless as a traction engine (?); a *fourth*, that "the shoes of the iron monster would not hold the ground," obviously indicating not too heavy a weight; and a *fifth*, that the engine was too heavy, its mere propulsion forward absorbing the greater portion of its steam power! We shall not attempt to reconcile contradictions so gross, but only point to the impropriety of erroneously finding fault and drawing hasty opinions, forgetting that in physical science failures must always be accounted for physically, and not opinionatively. In other words, let facts speak for themselves, but say nothing more. On all our railroads engineers are divided, one party advocating heavy engines and another light, but both are nevertheless agreed that a certain weight is necessary to drag behind it a certain weight; and doubtless this stands to reason; so that the practical question may yet be raised, is Boydell's engine (6½ tons) heavy enough for all agricultural purposes? But, from the results at Carlisle, we are taught that the less the weight of the engine the greater the number of ploughs it will draw behind it! The fact is, the "endless railway" met with universal approbation; but its application to a

portable steam-engine, conferring upon it the power of locomotion and traction, enabling it to move about backwards and forwards with ease, appears unexpectedly to have caught in bewildered astonishment no less scientific men and the press than the public generally, transporting them into strange ground, out of which more time was necessary to bring them safely than the rainy weather, and excitement of the Carlisle meeting afforded. This is not to be wondered at, considering the unsettled state of the public mind as to the best mode of steam culture; *one* advocating rotary action, a *second* the reciprocating action of the spade, a *third* the rectilinear of the plough, a *fourth* a fixed engine, a *fifth* a portable one, and so on, each biassed in favour of his own plan, forgetting that the endless railway is required by all before they can attain to success in the field.

We have said that the power in Boydell's traction engine was injudiciously applied. It was our intention to have pointed out this in detail; but as such a step would also compel us to notice how it could be obviated, we must defer both to a future occasion. But, however imperfectly steam was brought to bear upon the endless railway at Carlisle, the combination nevertheless was the leading object of attraction among all classes of the public, both there and also at the exhibition of the Yorkshire Agricultural Society. The latter were so satisfied with these, that they not only awarded it their £10 prize, but also were at the expense of taking it to the show-yard from Carlisle and returning it to London.

The sum total of the whole matter amounts to this: The "endless railway" (Boydell's proposition) only forms a solid foundation for steam culture, enabling portable engines to enter the field either on Hoskyns's plan, Romaine's, Usher's, Williams's, or Fisher's, without the assistance of horses. This we shall show in detail when we come to examine their respective propositions. In short, it enables steam as a motive power to supplant horses, and mitigate as much as possible the enslaving toil of our agricultural labourers, elevating them in the ranks of society. Horses to perform the carting, and steam to do the culture and thrashing only, may appear fine theory in the estimation of those who have not to put their hand into their pocket to pay the landlord his rent, but it is by no means promising to the practical farmer; for a horse to him is neither more nor less than a traction engine, and a very expensive one too.

CHEMISTRY OF MANURES.

ON FALLOWS.

TO THE FARMERS OF NOTTINGHAMSHIRE.

There is no need to remind you that the practice of fallowing is of the greatest antiquity, for it will be remembered by most of you that the Jews were commanded to allow the land to rest every seventh year. The Romans were the first to introduce it into this country: neither was fallowing then, nor is it now, confined to any particular class of soils, it being as common on light as on heavy land. His Majesty King George III. was in the habit of saying, "that the ground, like man, was never intended to be idle."

Now, it appears to me that the fallowing of light soils is perfectly unnecessary. (This, you must understand, I advance only as the rule—I am perfectly aware that there may be a few exceptions to it, but these occur only on strong undrained clays.) I do not allude to green crop fallowing—but naked fallows, for on light soils there is no impediment to the successive growth of crops with proper management, and as regards weeds they can readily be brought under subjection; but this is not so easily to be accomplished on clayey soils. The question, then, which naturally arises is—to what kinds of land is fallowing best adapted? But previous to entering upon this part of the subject, it might be as well briefly to state the nature of fallowing, both in a mechanical as well as a chemical point of view.

In the first place, then, the effect of fallows, or the period during which land is allowed to remain at rest, is to disintegrate the soil, or bring it into a finer state of division; and, on account of its being thus rendered more porous, this causes it to be more susceptible of the influence of the atmosphere. By means of the action of the atmosphere and the decomposing effects of the sun's rays, certain substances in the soil are made soluble which were previously locked up amongst its mineral constituents, such as the silicates of alumina, potash, soda, ammonia, &c. This is accomplished by the action of carbonic acid and oxygen in the air, aided also by the presence of moisture and rain water, which agencies are made considerably more powerful by the direct rays of the sun. There is much strong clay land scattered all over the country, which I think cannot be successfully cultivated without an intervening fallow. I say this, however, advisedly, because I am quite aware of what Mr. Mechi has done, he having proved beyond all doubt, that where expense is not regarded, bare fallows are utterly unnecessary; and this, too, is consistent with all my preconceived notions of the nature and properties of the soil. On poor sand land fallow is positively injurious, because it tends to diminish what little organic matter it already possesses; but on the contrary, on heavy soils the improvement is mechanical as well as chemical. It will be noticed that proper exposure to the air and the influence of the sun's rays, are the main features of the process of fallowing. The carbonic acid and oxygen brought down by the rain, exert a powerful effect upon the insoluble alkalies which are locked up in the clays. Inert vegetable matter is also so acted upon as not only to afford carbonic acid and ammonia, but to yield a supply of those salts which are contained therein.

The addition of lime, after the land has been well drained, is a powerful auxiliary in the process of fallowing on clay lands, and when largely employed at first, is the main agent in putting a stop to the necessity of using the naked fallow afterwards. So, then, in bringing stiff clays into cultivation, a naked fallow once in eight years, or even less, may be advisable; but when once the soil has been brought into good heart, a naked fallow is the worst possible mode of agriculture, provided the land can be kept clean without it; a naked fallow ought, therefore, to be looked upon as a necessary evil, and should be borne with as such, and only then upon heavy clays.

It may be asked what are the principal means by which fallowing may be superseded? This may be accomplished by deep drainage, by liming, by the burning of clays, or, where the land is perfectly clean, by a green fallow crop.

Thorough draining will rid the soil of all aquatic weeds, and render it more porous, consequently more accessible to the influences of the atmosphere.

Lime will be instrumental in dissolving the alkaline earths and silicates. The silicates of alumina, &c., contained in clays, might be digested in an acid (such as oil of vitriol mixed with a little water), for several weeks, without producing any appre-

ciable results; but after these earths have been mixed with lime and then digested in an acid solution, they will assume the consistence of a thick transparent jelly, which is owing to the silica being dissolved. The same process is carried on, but only in a much slower degree, by the carbonic acid of the atmosphere, which gradually prepares these mineral constituents of the soil for their reception by the spongioles of plants.

The burning of clays not only brings the land into a better state of division, but the process of burning renders the alkaline silicates more easily acted upon by the air, reducing them more rapidly into a soluble condition, and fitting them for supplying to plants the necessary constituents of their growth. It must be borne in mind that all soils ought to be accessible to the action of air—oxygen and carbonic acid—so as to favour the development of the roots of plants. Stiff clays are wanting in these properties, but this may be imparted to them by a partial calcination.

With regard to root crops, these may always be adopted where the land is in good heart and fit for their reception; for, during the growth of these fallow crops, by frequent hoeing and loosening the soil, pretty nearly the same results may be obtained as by allowing the land to lie idle; besides, the quantity of vegetable matter in a soil is considerably increased by green cropping—thereby leaving it in a far better condition for the production of a subsequent grain crop. It is true that the green crops oppose to a certain extent so complete a decomposition of the soil as when a naked fallow is used; but this deficiency may easily be supplied by artificial means, and the advantages of the increased supply of vegetable food in the shape of manure, of the stems and leaves of the plants and the fibres of their roots, will more than compensate for the proportionate decrease of inorganic matter which would have been brought into action by the naked fallow, which result may readily be obtained by a slight dressing of lime. Thus you will perceive that there are various means which may be adopted, either singly or collectively, as the case may be, for doing away with the practice of fallowing in the generality of instances, which will tend not only to a more successful cultivation of the soil, but at the same time will add considerably to the interests of the farmer in a pecuniary point of view.

I remain, your obedient servant,

SAML. PARR.

STOW-ON-THE-WOLD AND CHIPPING-NORTON AGRICULTURAL SOCIETY.

The Fifteenth Annual Exhibition of this Society was held on Thursday, September 13, at Stow-on-the-Wold, and was pronounced by parties competent to form an opinion on the matter as the best show that the Society has had since its formation.

The show yard was well attended, and the arrangements were excellent. The implement yard displayed a greater variety in that department than we have ever witnessed at Stow.

The following is a list of the awards made by Charles Randall, Esq., of Chadbury, the Judge of stock:—

CATTLE.

PREMIUM, THE GIFT OF SIR C. W. CODRINGTON, BART., M.P.

For the best horned animal in the yard, £5, J. H. Langston, Esq., M.P.

SOCIETY'S PREMIUMS.

For the best bull of any breed, above three years old, £8, Mr. Henry Roberts, of Paxford.

For the best bull of any breed, under three years old, £8, Mr. Thomas Garne, of Broadwater.

For the best breeding cow of any breed, and being in actual milk on the day of exhibition, £8, the Rev. Charles Barter, of Sarsden.

For the best fat cow bred within the district, having had a live calf, £5, J. H. Langston, Esq., M.P.

For the best fat cow bred within the district, having a calf, £3, Mr. H. Roberts; and £3, the gift of H. G. Busby, Esq., to the breeder, to Mr. Roberts.

For the best pair of steers, under four years old, £5, the Right Hon. Lord Redesdale.

For the best pair of heifers, under three years old, £3, Mr. Thomas Mace, of Sherborne.

For the best pair of heifers, under two and not exceeding three years old, £3, Mr. Thomas Mace.

SHEEP.

For the best long-wool tup, above two years old, £5, T. B. Browne, Esq., of Hampen; for the second best ditto, £2 10s., Mr. C. Gardiner, of Upper Swell.

For the best long-wool shearhog tup, £5, T. B. Browne, Esq.; for the second best ditto, £2 10s., Mr. C. Gardiner.

For the six best long-wool shearhogs, £5, Mr. R. Beman, of Moreton-in-Marsh.

For the six best long-wool theaves, £5, T. B. Browne, Esq.

For the six best long-wool breeding ewes, £5, Mr. G. Garne, of Eastington.

For the five best cross-bred or short-wool ewes, having suckled their lambs up to the first of June, 1855, £3, Mr. W. Hemming, of Coldicote.

PIGS.

For the best boar, under two years old, £3, Mr. Hemming.

For the six best pigs of a litter, not exceeding four months old, £2 10s., Mr. G. Garne.

HORSES.

For the best draught stallion that has served mares within ten miles of Stow-on-the-Wold or Chipping-Norton during the last season, £5, Mr. W. Coleman, Lower Worton.

For the best mare for agricultural purposes, and foal, her own offspring, £5, Edward Holland, Esq., Dumbleton.

For the best cart colt or filly, two years old, £5, Edward Holland, Esq.

PREMIUM, THE GIFT OF LORD REDESDALE.

To the exhibitor, being a member of the Association, of the best horse or filly, four years old, bred within twelve miles of Stow-on-the-Wold or Chipping-Norton, possessing or promising to possess the qualities of a hunter, £10, Mr. James Harbridge, of Little Compton.

EXTRA STOCK.

To J. H. Langston, Esq., M.P., for a short-horn bull, £5; to ditto, for a pair of dairy cows, £5; to Mr. L. Hambridge, for a pair of heifers; £5; to Mr. Thos. Garne, for a pair of heifers, £2; to William Polhill, Esq., for two boar pigs, £1; to ditto, for five sow pigs, £1; to Mr. R. Beman, for three wether sheep, £2.

The Judge commends the dairy cows exhibited by Mr. H. Roberts, J. H. Langston, Esq., M.P., and Mr. T. Garne; also highly commends the two-year-old cart colt exhibited by T. Beale Browne, Esq.

Lord Redesdale exhibited several remarkably fine specimens of roots, consisting of swedes and turnips, as field culture. They were grown by his lordship, and attracted great attention.

IMPLEMENTS.

JUDGES—Messrs. Huckvale and Savidge.

To Howards' prize Carlisle plough, £2.
Bentall's paring plough, £2.
Ransomes' last new plough, £2.
Gardner's turnip cutter, £2.
Moody's turnip grater, £2.
Richmond and Chandler's oat and bean mill, hand power, £1.
Corne's chaff-cutter, £2.
Turner's oat and bean crusher, for steam or horse power, £1.
Ransomes' hand chaff-cutter, 10s.
Howards' horse rake, £1 10s.
Smith and Ashby's hay machine, 10s.; improved scuffler, £1.
Crosskill's cart, 10s.; Crosskill's clod crusher, £1.
Ball's plough, £1.
Chandler's liquid drill, £2.
Parkes's steel forks, 10s.; improved steel cocking fork, 10s.
Cooch's dressing and finishing machine, £1.
Clayton and Co.'s steam engine, £1.

FISH MANURE.—A HINT TO FARMERS.

Sir,—In reading a French Journal, my attention was called to the following extract, which I think, if inserted in the *Yorkshire Gazette*, might prove useful in the agricultural districts. One of the hopeful things about the country is this: that the agriculturists are earnestly endeavouring to ascertain what are her resources, and how these resources can best be developed for the well-being of Great Britain. The French paper founds the article upon two papers—one in a Scotch Journal, the other in the "Irish Monthly Journal of Industrial Progress," edited by Mr. W. K. Sullivan, Professor of Chemistry to the Museum of Irish Industry. I hope that the species of indifference to any progress which might be effected in the country, not conducive to the special ends of some party, is rapidly disappearing, and that speculative energy among agriculturists will teach them not only self-respect, but self-reliance, which must in the end remedy their shortcomings.

"The islands near Africa and America are searched with the utmost avidity for guano, as a material for manuring land—a means of giving back to the soil those elementary constituents which the crops have taken away from it. In one year there were 200,000 tons of guano imported into Great Britain, at a cost to the farmers of one million and a half sterling. Not only is the store diminishing in those islands, but Governments are even on the verge of going to war concerning the property of the guano stores. Hence, a question has been asked—As a substitute for the potash of the American, Russian, and Swedish forests has lately been found in the potash of the ocean, can there not be found a substitute for American and African guano in the fish which fringe our coasts in such countless numbers? Fish are rich in that very element which gives so much value to guano, namely, nitrogen or azote. Whenever extraordinary shoals of fish have visited the coasts of Great Britain and Ireland, the superfluous portion which could not be consumed as food has been employed to manure patches of land, and always with beneficial results. The offal of herring-curing houses at Wick, in Scotland, and Yarmouth, and elsewhere, is disposed of in a similar manner. But such a plan can only be adopted near the spot where the fish are caught. The questions arise—whether a portable fish manure can be produced by a simple and inexpensive process; and whether the supply can be such as to render the manure saleable at a cheap rate? To the consideration of these questions two papers will be devoted.

"As to the constituents of fish in respect to the elements required for manuring, chemists have settled all this. Sprats and herrings contain 16 per cent. of nitrogenous matter; and all other fish contain a greater or less proportion. There is also an ash, or mineral constituent, useful as manure. If, therefore, the water of fish were expelled by drying, and the oil separated for use in manufacturing processes, the nitrogenous and mineral constituents might be made available for the farmer. The nitrogen is given off in the form of ammonia when the fish decays; the mineral portion contains phosphate of lime; and both the ammonia and the phosphate are among the most highly-prized elements of manures. Phosphate of potash, too, would afford another modicum of usefulness. Mr. Sullivan calculates, that if 100 tons of herrings were boiled to separate the oil, and then dried to dissipate most of the water, there would result nearly 14 tons of useful oil, and nearly 21 tons of solid manure, containing ammonia and two or three kinds of phosphates. As compared with guano, this manure would be equal to Peruvian, and superior to all other kinds as regards per-centage of ammonia, but less rich in respect to the phosphates. The ammonia, it must be observed, exists ready formed in guano, whereas it is in the elementary state in fish manure; therefore guano would be superior to fish manure where an immediate effect is to be produced, while it is possible that fish manure might be more advantageous where a slow but permanent improvement of the soil is the object. Arising out of this would be a probability that fish manure would be relatively better suited for light sandy soils, and guano for rich clay soils."

There next arises the question—how can fish be easily and economically converted into a portable and solid manure?

The inquiry is one of shillings and pence. Our authority thinks that 100 tons of herrings might be made to yield about 20 tons of manure worth £8 per ton; and 10 tons, of 252 gallons each, of oil, £29 10s. per ton; making together £455, or £4 11s. for every ton of herrings boiled down. Out of this he thinks that, taking one season with another, about £1 per ton might be cleared, after paying all expenses. Then comes an inquiry, however, whether a shoal of herrings is more valuable for curing or for transforming into manure—for food for man or for food for the soil. Mr. Sullivan decides in favour of the former; and he therefore looks to the offal of the curing-stations as the chief source of materials for the manure, of which offal

there is one ton to every 14 tons of herrings. He throws out the hint to small capitalists, that a manure and oil manufacture might be established at each of the chief fishing-stations; the offal might be made into useful manure, instead of being thrown into the sea [700,000 tons of bone, heads, and offal are annually thrown into the sea at the great cod-fishery at Newfoundland], and a fair profit, he conceives, might be reaped thereby. He does not recommend a joint-stock company; but smaller establishments, each complete in itself. A patent has been taken out by some one, and a company suggested, under the grandiloquent title of "National Fisheries Guano Company." But Mr. Sullivan eschews all grandiloquence; he appeals to small capitalists, each in his own locality, and asks —"Who will be the pioneer?"

I have already trespassed too much on your space. In a future communication, I will give four years' experience of fish manures, by M. Molon, of Concarneau, between Brest and L'Orient, on the sea coast of the department of Finisterre, in France.

I am, Sir, your faithful servant,

Slingsby, 9th May, 1855. CHARLES ARDS.

—"Yorkshire Gazette."

INSECTS DESTRUCTIVE TO GRAIN CROPS.

In a former article we alluded to the prevalence of insects destructive to grain crops in particular seasons, especially of the aphides. At the present time the destructive effects of an insect upon our wheat crops has become apparent to such an extent as in some instances to have affected the yield upwards of 25 per cent. This is the insect alluded to by the Rev. Mr. Sidney at Mr. Mechi's late gathering; and interesting as his description of it was, we think it would have read better had he not taken to himself the credit that he was the only person there who had noticed its prevalence upon the wheat crop; for, long before Mr. Sidney had investigated the subject, it had been treated upon and explained in our columns. And we believe the destructive character of the small ichneumon, as also described by him, which attacks its larva, was first made known to the public through our pages; at any rate we can produce information upon the subject of upwards of twenty-five years' standing, and therefore conclude that most of the persons present at that meeting must to some extent have become acquainted with its habits.

The cecidomyca tritici is a small pale orange-coloured insect, with prominent black eyes, of the form and about half the size of a common gnat, that is rarely visible except at the time of the wheat coming into ear, when it may be seen on fine still summer evenings, from four o'clock until sunset, quietly at rest upon the protruding wheat-ears, as well as upon those recently developed, with what to an ordinary observer would appear to be its tail; but, in reality, its ovipositor, inserted between the glumes of the wheat chaff, where it deposits its eggs; and by the same process causes the chaff to adhere by some glutinous substance, so as to prevent the anthers escaping, and thereby retaining the pollen and preventing the fructification of the particular germs attached by them, the object of the insect appearing to be to secure the pollen from further development for the sustenance of its progeny, which shortly appear in the form of small orange-coloured maggots, and which, upon being exposed, move with a particular kind of jerk, and remain in their larva state until the approach of harvest, when they become transformed to the pupa or chrysalis state, and fall to the earth, where it is presumed they remain until the following summer, when they assume the perfect or fly state, to again resume their attack and reproduce their progeny in like manner as before.

The small ichneumon fly, also alluded to by Mr. Sidney, is a small black insect of a long taper form, with a pointed tail-like ovipositor, with which it strikes its victims, and deposits its eggs beneath their skins, usually causing their destruction; but from the secluded position the larvæ of the wheat fly obtain betwixt the glumes of the wheat chaff, we apprehend but few of them are approachable by this insect, and from extensive examinations made year by year, believe that most of them undergo their transformation, and enter safely into the pupa state, and if the thrashing floor of the wheat be examined, myriads of them probably will be found mixed up with the wheat-chaff.

In this brief description of the insect, and its habits, it will be seen that no human foresight will enable the farmer to arrest its progress. It is probable that, at the time of the wheat coming into ear, the fly comes also into existence in its perfect state, and proceeds at once to perpetuate its species in the manner described. Sometimes, from the wheat coming early into ear, the forward pieces escape altogether, and the later pieces only suffer. In the present year the early pieces have suffered greatest, and this may be at-

tributable to the season being several days later upon the average, the early pieces, in point of time, being exactly where the late pieces usually happen, and, from the weather having been cool, and with little sunshine at the time of the wheat earing, that process was extended through a considerably longer period than usual, whereby the attack of the fly was prolonged several days, and thence the destructive effects so visible in the majority of pieces this season.

Some kinds of wheat are more liable to become attacked than others; indeed, it is an established fact, that in proportion as the variety is more or less delicate and tender, so does the attack more or less prevail. Talavera, as well as all the early descriptions of white wheat, is more susceptible of attack than the later kinds of either white or red wheat; but the early sorts of red wheat are also proportionately more liable to become attacked than the later and coarser descriptions, and this rule will be found to obtain to a great extent in the present season; still, upon examination a smaller number of larvæ will be now found than usual, although it is perfectly clear that they existed about a fortnight ago in much larger numbers than common.

In stating an opinion that they will be less prevalent in 1856 than in the present year, we do so without hesitation; and we base that opinion upon the circumstance of so few having arrived at their proper state in the present year. This we attribute to the continuous showery weather that we have of late experienced. It is not in this instance only that we prophesy future results; for with many other insects we are enabled to foretell like results, as the number of them in future seasons depends upon the state of weather at the time they usually appear in any preceding one. Thus with the click beetle—the parent of the wireworm: if the latter portion of the month of May and beginning of June be warm and dry at the time it deposits its eggs, most of them become hatched, and a numerous progeny of the grub in the succeeding year will be the consequence. So also with the wheat midge: if the latter portion of July and beginning of August continue dry and warm, myriads of them pass into the pupa state, to reappear in the following season.

At present no remedy has been devised for their destruction; nor do we think it could be accomplished at any time after they have emerged from the ground. It is possible that their numbers may be diminished by carefully separating them from the chaff at the time of dressing the wheat, and destroying them; but if once they become transferred to the farm-yard, and are incorporated with the manure, it is probable that they will be again reproduced upon the spot where the manure is applied in the following year, as many descriptions of insects are found to be able to withstand the operations of husbandry with little injury to themselves; and the tenacity of life in all classes is such, that the merely carrying them with soil tends rather to their preservation than otherwise.

THE SPARROW.

The sparrow is a well-known, lively, swaggering, little fellow, in a slightly variegated brown and grey jacket, who hops boldly about our habitations, and is much addicted to holding public meetings in bushes and shrubs, at which knotty points are discussed with considerable volubility, and physical force invariably resorted to. In this and many other countries, wherever man has fixed his abode, there his constant attendant, the sparrow, is heard uttering his monotonous but not unpleasing chirp; and truly one might have thought such close community would have engendered better feeling between the two. But no! unfortunately, Sir Sparrow loves corn as well as his lordly neighbour, and for this offence is condemned to die. Surely, however, a creature who is able to maintain an existence, and that, too, in considerable numbers, against the fearful amount of persecution to which the sparrow is exposed, should have some important mission to fulfil. Let us inquire into the private history of the little fellow, and see if his hard fate is altogether deserved, or at least, if there are no mitigating circumstances in his case. It is not, perhaps, generally known that there are two species of *Passer* in this country. The house sparrow (*domestica*) and the tree sparrow (*montana*). They are very similar in appearance, and differ so slightly in habits, that one biographer might serve for either. Both make large dome-covered nests under tiles, beneath thatch, and in trees. The tree sparrow, as his name indicates, is most frequently found in trees: when he selects thatch, he makes a hole downwards, by pulling out straws from the top, instead of burrowing upwards from beneath the eaves, as the house-sparrow does. Both species like warmth, and accumulate vast quantities of straw, hay, feathers, and anything else that comes handy, to form their nests. I recollect once, when a boy, finding my ingress to a sparrow's nest obstructed by some-

thing unusual; yard after yard I drew away, until fifteen feet of lace edging came forth, that had been missed from the drying ground a week or two before. The eggs of both species are white, delicately spotted with dark, and generally five or six in number. The young, when hatched, are assiduously fed by the old birds, almost entirely upon caterpillars and grubs. These and other soft matters continue to be their food until the following autumn, when young and old assemble in flocks, visit the corn fields, and become grain-eaters. It is this latter fact that has excited the hostility of man. There is no doubt the sparrow does make free with corn, both in the field and rick, and dearly does he pay for his presumption. Every contrivance that the ingenuity of the agriculturist can devise is employed to effect his destruction. Boys are paid so much per dozen for his head; and even, in one instance, a regularly organised "Society for the Destruction of Sparrows" has been formed. Man says, in his pride, "he destroys *my* corn; therefore he must be destroyed." Poor fellow! he takes a grain of wheat, and is immediately immolated; the hosts of more insidious foes he has extirminated are forgotten; no one remembers his good deeds; few, perhaps, except the prying naturalist, are aware that he has any good in him. But so it is; and it would be well if the tiller of the ground, before mercilessly dealing death and destruction to his supposed enemy, would first ask—"Why were sparrows created?" "Is not the grain *his* as well as *mine?*" Did not the same Creator who gave corn to man for food, give it also to the sparrow? and "shall man place his puny wisdom and self-interest against the forethought of the Almighty?" Rely upon it, whenever he does so—whenever he disturbs the balance of compensation established by the wisdom of God, he lets loose upon himself some hostile power previously held in check; and the odds are, that the "last state of that man is worse than the first." The sparrow feeds its young chiefly, if not entirely, on the larvæ of insects, and is engaged about three months in every year in rearing successive broods. According to one observer, "they bring food to the nest once in ten minutes, during at least six hours of the twenty-four, and each time from two to six caterpillars are brought." Another observer states that he once saw two pairs of sparrows bring food to their nests 104 times in one half-hour! the food being in this instance maggots obtained from the body of a dead cat. From calculations based on these data, it appears that a single pair of sparrows may cause the destruction of from 12,000 to 26,000 insects during the breeding season alone! and careful observation for some years has convinced me that at least 3,300 insects, exclusive of other food, are yearly consumed by each sparrow. Of course these observations refer to the country; in towns sparrows assist the Boards of Health by picking up many savoury morsels that might otherwise "waste their sweetness" on the air of streets and alleys, consequently their consumption of insects will be somewhat less. Sometimes, when the young birds are newly hatched, they suffer part of their food to escape into the nest, so that any one who will take the trouble may easily ascertain its nature. In this way have been found several species of caterpillars that swarm on garden produce and in hedges, grubs that infest the turnip, wire-worms, and other depredators, whose ravages it would be impossible for man to contend against, unassisted by those creatures especially constituted by Omnipotence to prey on them for food. The sparrow, then, has an important mission: he is commanded to assist in preventing the overwhelming increase of many insects most inimical to man, and, in return for the service thus rendered, the small quantity of grain he can by any possibility obtain, should, I think, be ungrudgingly bestowed upon him. Let the farmer who is most vigorous in the persecution of the sparrow, call to mind the last time his turnip crop was a failure through the agency of creeping millions he could neither shoot nor trap. I will furnish him with a case in point. About ten years ago, an old round tower, on the domain of the Bishop of Durham, which was much dilapidated, and had become the abode of multitudes of sparrows, was repaired—the holes were all pointed up, and the sparrows, of course, dispersed. Two years after, the field in which the ruin stands was sown with turnips. When the plants were six weeks old, they became entirely covered with grub, and nine women were employed daily for some time gathering and destroying them. This occurrence opened the eyes of his lordship's bailiff, who caused some of the holes to be re-opened; the sparrows again took possession of the tower, and "since that time there has been no more trouble or loss with caterpillars."—"Doncaster Gazette."

RENTAL OF LAND.—In 1692 the rental of land was estimated at 10 millions, in 1770 it was valued at 16 millions, and the land was found to be held by 280,000 persons. In 1815, the value of landed rental, found by assessment, exceeded 51 millions, and the holders were no more than 36,000. In 1842-3, an increase of 34½ millions had accrued to the landholders, and the value was stated at £94,816,269, including property in houses. A calculation has been made of the national losses by the device of the land tax. It is founded on Sir Robert Peel's estimate of the rental at 72 millions. In the 78 years from 1692 to 1770, the average rental was 32 millions; but from 1770 to 1847, the average was 66 millions.

HINTS IN FARM PRACTICE IMMEDIATELY SUBSEQUENT TO HARVEST.

Every field under crop should be broken up immediately on the removal of the crop. The good it thus receives from atmospheric influence is incalculable. The earlier it can be effected after harvest the better; and the more it is stirred, without turning over, the greater the benefit. Should the farmer's exigencies be such as to make it an impossibility, perhaps he could find time to harrow the surface, which would promote the vegetation of the dropped seeds of weeds or grain, which again would tend much to help in cleanly farming, as also form a slight green manure crop for being ploughed in.

To aid such operations, it should be a positive rule on every farm to mow every crop except the very heaviest, and nearly all of them. It is much to be deprecated that farmers allow so much strawy matter, *i.e.* stubble and the like, to rot and decay upon the land, without being converted into good dung. Most farms might be made self-supporting if all the growth of the crop was gathered in previous to suffering loss from decay and evaporation. Rotted stubble is nearly valueless for litter; if harvested by mowing, it makes good fodder and much manure.

Every field should be stocked as soon as cleared, so that all weeds, grasses, stray grains, &c., may be eaten. It thus relieves the grass pastures, and permits their satisfactory growth for winter pasturage. Pigs will thrive well on these fields during the time of breaking up, or under their continued culture; they will fatten where there is an abundance of root weeds, providing a little corn is given at night.

Implements for stirring and pulverising the soil should be put in the best order for the purpose above named. No farmer ought to be without such implements. The facilities with which our modern scarifiers or cultivators will break up the soil is astonishing: we mean such as Bentall's, Biddle's, Coleman's, and the like. These implements leave a farmer no excuse for omitting such necessary autumn cultivation.

This kind of husbandry is of immense advantage in destroying roots of weeds: the dock, the thistle, the twitch, and other creeping roots, may be worked to the surface and picked off: it also prevents the growth and full maturity of all seeds of weeds; besides this, it acts most powerfully upon the soil, by opening up pores and innumerable surfaces for aëration—that invaluable restorative of exhausted nature to all soils.

It is the proper time for ploughing-in all kinds of herbage crops, for manure, *i.e.* white mustard, buck-wheat, &c.; these should be ploughed carefully down, well clogged in, and rolled down till the field is required for sowing, when, with a good harrowing, the seed may be effectually put in without further trouble.

Those fields which were not mown at harvest-day should have the stubbles mown and carried before it is dried and decayed by much exposure to weather. The waste on most farms in this one article for litter and manure is very great.

Every effort should also be made to put all fences, ditches, and drains in order, so that all may be in readiness before the autumn rains descend. If the soil is fully saturated at this season, there is but a poor chance for the wheat-seeding and subsequent crop.

In the stock department of the farm, much has to be done. This is generally the season when most danger arises from defective herbage and water. The stocking of the stubble fields will mostly prevent much injury. On breeding farms the lambs and young cattle and foals will require all the best of the breeding pastures, and the fating pastures should be relieved by stocking the eddishes or aftermaths with the most backward stock. Breeding ewes should be selected from the flock, and, together with the store sheep, may be put on the stubble fields. The cull or cast ewes should have the best and most suitable pasturage to promote their gradual improvement—too strong or rich succulent pasturage is not proper for them; it would cause them to scour; weak animals require moderate pasturage. Young calves should have eddishes, if strong enough, on being weaned. In stocking stubble-fields care should be taken lest the animals eat too much dropped grain, or that the oat and barley fields are not too luxuriant in herbage, as is often seen; such food is too laxative in its nature; too many beans or peas produce colic and flatulency.

Cart horses ought to be wholly in the stable or foldyard, and have dry food at this season.

Diseased potatoes should be secured as far as possible from all atmospheric influences or wet weather. This should be at once done, either by taking up and graving down, or by an additional remoulding up by the moulding-plough or hand-hoe, so as to close up the crevices in the rows. This practice is well worthy general attention.

Diseased turnip crops—of which I regret to say we have many from mildew, blight, and insects—

require immediate attention. Horse-hoeing, hand-hoeing, and sub-pulverization, is the best practice if practicable. The bottom and outer leaves, where much diseased, are as well to be taken off, so that no fear of damage need arise from injuring them by horse-hoeing, and which may readily be effected on the ridge system, and hand-hoeing must be attempted on the flat. It is to break up the soil and promote further progress in the plant that is so requisite. The disease generally arises from some sudden check in the growth of the crop.

Mangolds and turnips for seed crops should now be sown for transplanting.

The grass lands should all be looked over, and every thistle carefully destroyed: it is at this season that thistles, through neglect or oversight, contrive to mature their seed, and is the chief cause why pastures are overrun with them. Most farmers are careful to eradicate them during the summer, but in harvest they take their chance.

This is the best time to mow or "hob" all rough herbage in grass pastures, which will make a little hay this scarce season, and much improve the pasturage for winter.

N.B.—To a "Constant Subscriber": "Docks" are indeed real "pests;" they produce a great abundance of very hardy seeds, which, with a most undying root, will always keep grain-fields in good stock, unless you use great care. Never allow a single plant to ripen its seeds; dig or fork up the roots from every field under crop, and carefully pick them from every fallowed and cultivated field. Thistles are bad enough, but less pernicious than docks. Deep hoeing and spudding, closely followed up in all crops, and good fallowing, will rid arable lands of them; and pulling up with tweezers in wet weather, and spudding them deeply in dry weather, will eradicate them from pasture lands.

THE FOES OF THE FARMER.

The faculties of farmers need never go to sleep. On all sides there are objects and incidents sufficient to keep them wide awake, and to exercise their utmost ingenuity. It has been said that farmers are working chemists; and whether they are aware of it or not, they are verily conducting and superintending all the while great chemical experiments and processes. They carry on during the growing seasons sundry processes for the conversion of the constituents of the soil, the air, and the fertilizers at their command, into the largest possible quantity, and the best possible quality, of such vegetables as they may wish. The processes by which these changes, or conversions of dead matter into living forms and useful vegetables or plants, are carried forward, are chemical in their nature; and are continually calling upon farmers to use all the powers of observation, reflection, and reasoning which they possess, and to acquire all the knowledge of chemistry and of Nature's operations which they can, in order to conduct the processes which they superintend to the best possible result, or, in other words, so as to produce the largest and best crops.

But, in addition to being, consciously or unconsciously, *working chemists*, farmers are also *fighting soldiers*. They are surrounded on all hands by enemies. They have a continual warfare to carry on. From the moment they put their seed into the ground till they carry their products to market, or use them on their own premises, they have to guard against or contend with foes and depredators of many kinds. Worms, and grubs, and birds, and squirrels, and rats, and rabbits, and many kinds of flies, insects, creeping things, and four-footed beasts, are but companies or regiments in the great army whose depredations and warlike attacks they are called upon continually to watch and ward off.

This grand army of the foes of farmers—this host of robbers and depredators, why has it been called into existence? and why is it permitted to continue? We have sometimes been inclined to think that farmers were surrounded with so many cunning and greedy foes in order to give their powers of ingenuity, contrivance, and so forth, abundant opportunity and occasion for exercise, and to call out their faculties into sleepless activity.

But we have not yet arrived at what we took pen in hand to write. We wished to let farmers know that their enemies were not all of the tribes of brute animals which we have named and referred to, but included also some of their own kindred and of their own species. Every now and then we hear of something which gives us note of the existence and operations of a crafty set of foes to farmers among those who outwardly have the form and appearance of men, but are inwardly more of the nature of the fox, the wolf, or the serpent. The most recent instance of the impostures and frauds of this class of the farmer's enemies which has come to our knowledge, is from the other side of the Atlantic. But, as what has been may be again, and as this species of enemy will appear here, if

he has not already appeared, we have thought a brief notice of the fraudulent practices carried on abroad, would not be without some degree of interest, and some use in the way of warning and instruction, at home. An old proverb says truly, "Those who are forewarned are forearmed."

At the close of last season, a rise in the price of Peruvian guano was established by the agent of the Peruvian Government. In Great Britain this has had the effect of stimulating the trade of adulteration, and of increasing the sale of spurious fertilizers. Several secret mixtures have been advertised and put into the market, with the title of "cheap," "economical," &c., attached to them as bait. The vendors and compounders of these secret mixtures seem to have been driving of late a very flourishing trade, by the help mainly of certificates from farmers as to the extraordinary results of such manures. Very few of these certificates give the actual results of the produce, but are commonly expressed in very general terms. Now it is to be lamented that farmers should thus become the instruments in the hands of their worst enemies in deceiving their brethren. It would be well for the whole agricultural fraternity, if farmers should refuse absolutely all solicitation or friendly promptings as to certificates, until they have made the fullest and fairest trials: or that, if they give them at all, they should give the results of the produce, and these stated in the simplest and most reliable form possible.

One trick practised by the manufacturers of several of the fertilizers lately introduced, deserves to be put on record, for the benefit both of those who are asked for certificates, and of those who are likely to be influenced by them. There is good reason to suppose that some of the samples given out for experiments to those from whom certificates are to be solicited, have been changed and improved in composition and quality. By the addition of sulphate of ammonia or nitrate of soda, a high manurial character may be given to compounds of little value without them. The interest of manufacturer and vendor will lead them to send out in such cases the most favourable samples, even when such gross deception as the above may not be practised.—"The Country Gentleman."

CHEAP FUEL.

Sir,—I copy the following description of making coal-balls from the Museum Rusticum, published in 1765, as, by possibility, it may be usefully adopted in some situations, either to enable the poor to obtain fuel at a cheaper rate, or remove a nuisance where river mud accumulates, or give a hint to sanitary commissioners.

"About Bristol, Bridlington, and other places in the West of England, they commonly make coal-balls of their culm or small refuse coal.

"They take a quantity of culm, and add the same quantity of *mud* which the tide leaves on the sea shore: after mixing them with shovels, they blend them together with their hands, and mould them into balls 6 inches in diameter.

"These balls they burn immediately as they are made, or they may be kept as long as the owner pleases. They make them at Croken-pill, in the river, seven miles from Bristol.

"At this place they seldom use any other fuel, and find it answers extremely well, making a good fire, and lasting longer. I have seen this fuel burnt many times, at all seasons of the year, and always observed it made a good fire; neither does it emit any disagreeable fumes.

"It has not been used in these parts above 30 or 40 years, but is now greatly preferred, though they can buy coals at 3½d. per bushel laid in. How much more then ought this fuel to be recommended in the metropolis, where coals are four times as dear!

"Coal-balls are made at Carmarthen with clay in lieu of mud, but here they use two parts of culm and one of clay, adding a sufficient quantity of water to temper it, the same as if they were making mortar with lime and sand. This practice of making coal-balls with culm and clay has been in use about Carmarthen many centuries."

In vol. 2nd there is an account of coal-balls made at Leige, as follows:—

"One-third of unctuous clay (in which there must be no sand or gravel) and two-thirds of coal-dust; mix and incorporate them well together, make them into round balls *or brieks*; if made in summer time, and laid to dry for use in winter, they will sooner light. Thus you have a hot, clean, lasting fire, not at all offensive to the smell. Some clay will do if mixed two-thirds clay and one-third coal-dust; and the true proportion of the mixture must be found by experience; but it is best to put too much coal-dust than too little at first, because men are apt to be discouraged in making experiments. This mixture of coal and clay is called 'de bouchy.'

"This coal lights easily, and gives a great heat; and the *Liegos* boast of having the best bread, the hardest iron, and the hottest fire.

"By a printed paper, published in 1628, it appears that this fuel was known in England at that time, and said to be discovered in 1594 by Hugh Plat.

"In 1716 it was proposed to make coal-balls with the black ouse of the Thames, at 4d. per bushel."

The writer of the above account stated that he had used this coal and clay mixed, upwards of ten years, and, by experience, he found it to answer well; that, "it is a most excellent fire for roasting, for heating irons, or warming a room." He used it in his kitchen, laundry, parlour, and library.

As clay ashes are greater in bulk than the clay previous to being burnt, the above process would produce abundance of useful manure, having both a mechanical and physical effect; and if the sewerage of towns, when conducted into reservoirs, is found to leave a sediment, when the water is let off, sufficiently solid to manufacture and burn, it probably would pay the cost of manufacturing, now brick-making machines have so much reduced the cost, even if found offensive *from the smell* to use as fuel.

If sand, stones, or gravel exist in clay, by being puddled in reservoirs all such fall to the bottom, the clay settles on the surface, and the water when clear being let off, a body of "unctuous clay fit for burning" remains, and thus cheap fuel may be had in inland districts where the carriage of coals cost half as much as the coals.

Many steep short hills have been lowered on many roads on a gravelly soil, where the gravel sold for as much as the labour cost; and if clay can be converted into useful fuel, short hills on roads where a clay soil exists may be reduced in height at a less cost; at least it makes it practicable to reduce the height of short hills, as the burnt clay would sell for manure if it did not for fuel; while clay in its natural state is useless in a clay district, and no place can be found to deposit it.

CHARLES POPPY.

Witnesham, Ipswich, Aug. 10, 1855.

REAPING MACHINES.

Since the days when Boadicea literally cut her way as she drove along, the reaping-machine never promised so well for really practical use as it does just at present. To adopt, however, the favourite expression of the agricultural orator, it is required now rather for the arts of peace than those of war. Any contention that this, the chosen implement of the Amazon Queen, may have excited, has been carried on with the one only object of to whom shall be the credit of having done the most good? There is no doubt that this struggle has been a long and arduous one. We may add, too, that it has been almost equally honourable to all engaged in maintaining it.

This would appear at length to have been brought to something like an adjustment. Beyond, moreover, the fact of which firm may have the best, and which again but the second-best, the reaping-machine has at last all the advantages of a warrantable introduction. From what we ourselves have seen of it in our home towns during the past summer—from the great improvements achieved since last year—we have been enabled to record it already as an invention that promised quickly to become one of the common implements of the farm. We consider the trial which took place near Bristol, on Wednesday, Aug. 29, to be altogether in confirmation of this. Of the four machines to which this adjourned test was the more properly confined, one received the first prize, another in due order the second, and a third a high commendation—the three being "very generally approved."

In the present scarcity of labour, it is difficult to estimate how great an advantage this may become. At all times, indeed—in a catching climate like ours, when opportunity should be ever made the most of—the reaper must be a great boon to the farmer. It was satisfactory, in our late visit to Ireland, to notice how ready the agriculturists of that part of the United Kingdom were to appreciate its employment. They at once recognized in it a welcome supply of that very unusual want with them—a scarcity of labour. The variety they have commenced with is that known as Dray's Hussey, which, although only the "highly commended" at Leigh Court, we believe will in its present state do justice to those who may trust to it. It will be remembered that in our report of the Carlisle Meeting we stated that this adjourned trial appeared to be between Dray, and Burgess and Key. For the last two or three seasons the latter had not often occupied the first rank. The improvements, however, of this year were so evident, and so excellent, as to at once bring it back to that position it had first aspired to. As not only a wheat-cutting implement, but for all other kinds of crop, it has equal claims to the attention of the practical farmer. Indeed, the makers generally are coming more and more to this; while the accident which happened to the prize machine will but serve as a further lesson of how it may be really fitted for every-day work.

The second prize, as will be seen, went to Palmer's improvements in another American machine. We cannot speak so pointedly to the merits of this, for the simple reason that we do not know so much of it. And this brings us to just one word to the managers of this "adjourned trial." It was announced as a "private one;" but was it intended to be so private as to exclude the representatives of the agricultural press? We fancy not; or, if it was, such a course is, happily, so far, without a precedent in the proceedings of the Royal Agricultural Society. It will be a bad day for that society and those who support it, when such a custom is suffered to become anything of a general one. We can understand the objection to a great crowd interfering with the labours of the Judges; but we cannot understand that careful provision to ensure *not* having the proceedings fully reported. It is an injustice to the exhibitors; it is a neglect of the public's interest on the occasion; but we trust it was not intended as a slight to the press. We are the last in the world to ask favours of any society: only let us be assured that admission is to be obtained, and we visit many a meeting without thinking it necessary to trouble committees or secretaries with any application on our account. The entrance, however, at Leigh Court, in the face of a "private" announcement might have been doubtful; and we so say distinctly, on behalf of ourselves and our fellows, that the agricultural press of this country should have been directly invited to attend. Would the judges have objected? would the exhibitors have objected? or did Mr. Miles himself object? If any of these, who and *why?*

We write this in justice to ourselves, and in explanation to our readers. We attend every meeting in the three kingdoms that we consider worthy of a special report, and we should have attended this had we been allowed to do so.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The deferred trial of the Reaping Machines selected at the Carlisle Meeting took place at Abbot's Leigh, near Bristol, on Wednesday, the 29th of August, in the presence of Mr. Miles, M.P. (President of the Royal Agricultural Society of England at the Carlisle Meeting), Sir Stafford Henry Northcote, Bart, M.P. (Steward of Cattle at Lincolu), Sir Archibald Keppel Macdonald, Bart. (Steward Elect of Implements at Carlisle), Mr. Dyke Acland (one of the Editors of the Journal), Mr. Raymond Barker (Vice-President and Chairman of Finance), Mr. Brandreth Gibbs (Honorary Director of the Show), Mr. Granger (Judge of Field Implements), Mr. Hamond (Steward of Implements at Exeter, Lewes, Gloucester, and Lincoln), Mr. Fisher Hobbs (Steward of Implements at Lewes, Gloucester, Lincoln, and Carlisle), Mr. Hudson (Secretary of the Society), Mr. Huskinson (Judge of Field Implements), and Mr. Clare Sewell Read (Judge of Field Implements); including among the exhibitors Mr. Burgess, Mr. Alfred Crosskill, Mr. Dray, Mr. Key, Mr. Peter Love, Mr. Mackenzie, Mr. Palmer, and Mr. Suttie; and among the general company Sir John Key, Bart., Capt. Gordon, Mr. Philip Miles, Mr. Knatchbull, Mr. Pitman, and Mr. George Pope.

Mr. Miles having directed every arrangement to be made for the supply of his own horses to work the machines, and for the order in which successive crops of wheat and barley, under the most favourable as well as under the most unfavourable circumstances for reaping, were to be cut, the competing machines were set to work simultaneously, under the orders of Mr. Fisher Hobbs, and the inspection and critical examination of the Judges. No pains were spared by every one engaged to render the trial in every respect perfect and satisfactory. This result was finally attained; and it is probable that no reaping machines in this or any other country have ever been more severely, impartially, or satisfactorily tested than in the trial at Abbott's Leigh.

I. Prizes offered.—For the best Reaping-machine, £30; for the second-best ditto, £20.

Special Condition.—In adjudicating on the Reaping-machines, the attention of the Judges will be particularly called to the best mode of delivery.

II. Judges' Awards:—

"Leigh Court, August 29, 1855.

"We award the 1st Prize of £30, for the best reaping machine, to Stand 68, Article No. 1, Messrs. Burgess and Key, for M'Cormick's reaper improved by themselves. The 2nd prize of £20, for the second best ditto, to Stand 79, Article No. 3, Mr. John Palmer, of Stockton-on-Tees, for Forbush's reaper improved by the exhibitor. We highly commend Stand No. 34, Article No. 3, Messrs. Dray and Co., for Hussey's reaper improved by themselves.

"T. W. Granger.
"Thomas Huskinson.
"Clare Sewell Read."

III. Exhibitors' Catalogue-Specifications.

Stand No. 68, Burgess and Key, of 103, Newgate-street, London; Article No. 1 (New Implement).—A reaping machine, invented by Cyrus Hall McCormick, of Chicago, United States of America, improved and manufactured by the exhibitors. It received the Council Medal at the Great Exhibition in 1851; the Prize Medal at the Yorkshire Show in 1852; the award of the Driffield Farmers' Club; first prize of the Durham County Meeting in Sunderland; and the award of the jury appointed at the nine days' trial of reapers at the Royal Agricultural College at Cirencester, and after the test of four years it is found to be a machine which will cut under any circumstances when desirable. It is so constructed and of such materials that it is not liable to get out of repair, and is easy draught for two horses, and when required can be repaired by any carpenter or blacksmith on a farm without sending it to the manufacturer. The only objection to this reaper was owing to the fact that our crops being much heavier than those grown in America (where some thousands of these machines have been in work for the last 14 years), it is found in some cases to be very hard work for the man to rake the cut crop off the machine; and this objection we believe we have completely overcome by means of our patent Archimedian screw platform, which, without adding to the draught, delivers the cut crop off the side of the machine in a perfect swathe. The only labour, therefore, now required to work this machine for a day on level land is two horses and a lad of about 15 to drive; on hilly land the draught is, of course, more, and a change of horses would be required. Price 35 guineas.

Stand No. 79, John Palmer, of Stockton-on-Tees, Durham; Article No. 3.—(New implement.)—A combined reaping and mowing machine; invented by Forbush, and Co., of Buffalo, United States; improved by the exhibitor; and manufactured by Forbush, and Co, and the exhibiter. This machine is especially adapted for small occupations, and it is also suitable for large occupiers, when it is thought desirable to deliver the corn in sheaves. The driving works of the machine are so arranged as to prevent a side-draught or a tendency in the machine to run into the uncut corn. There is no pressure upon the horses, the machine being evenly balanced. The knife cuts from the centre of the driving-wheel, hence the stubble is left the same length on the ridge as in the furrow. From the peculiar construction of the guards, and the pierced or skeleton knife, the tendency to choke is completely overcome. By the application of Palmer's roller platform, the heaviest and longest crops are delivered with ease. By using the radiating roller platform, Barley, Oats, and short Wheat are delivered at the side, out of the track of the horses. Price, with back platform, 25*l.*; with radiating platform, 5*l.* extra.

Stand No. 34, William Dray and Co., of Swan Lane, Upper Thames Street, London; Article No. 3.—A patent Reaping-machine; invented by Obed Hussey, of the United States, improved and manufactured by the exhibitors. This machine has considerable advantage over that known as "Hussey's Reaper," and received the prize of the Royal Agricultural Society at Lincoln, 1854, in addition to those of the Bath and West of England, the Stirling, the Burnley, and North Lancashire, all in 1854; thus gaining every prize for which it competed. Its great advantages consist in its having a tilting platform, which enables the attendant to deliver the grain with

the greatest ease; a patent skeleton knife, instead of the solid blade in the original, which effectually prevents choking; has a leverage for raising and lowering the cut, and a wheel to relieve the horses of the weight of the machine. Price 25*l.*

Thus has concluded a trial which will be memorable in its immediate effects, and in the future results to which it will doubtless lead. The report of the stewards and judges, in reference to its details, along with the report of Mr. Fairburn (communicated to Mr. Miles), on the trial of reaping machines at Paris, will appear in the next part of the Journal of the Society. In the meantime, Messrs. Garrett and Son, of Saxmundham, and Messrs. Ransomes and Sims, of Ipswich, have entered into arrangements to manufacture for Messrs. Burgess and Key the reaping machine which has gained the first prize at Abbot's Leigh.

The splendid character of the weather, the beauty of the scenery, and the true English hospitality displayed at Leigh Court; the excellence of the trial, and the satisfaction and generous rivalry only of the competing exhibitors, were all of them gratifying circumstances, which appropriately terminated Mr. Miles's presidency of the Royal Agricultural Society of England, in the same spirit and with the same decided effect as had marked its progress in every transaction from the commencement.

AGRICULTURAL POSSIBILITIES.—STEAM CULTURE.

What alterations in cropping may be right and beneficial? This is an important question, but in what respect is it more applicable to steam culture than to other modes of culture? Our answer is that we cannot with our present appliances obtain such deep and perfect culture as may be achieved by steam power. We again repeat that we saw at the Lincoln Meeting a six-horse power steam-engine doing an almost incredible amount of work at one operation, which it did by the multiplication of crane-gear on the engine. This power, and more, then, can be brought to bear upon a given plot, can be applied either to break up the soil at any required depth, or pulverize it effectually when broken up. We know of no power capable of such ready application, or able to perform such astonishing achievements in agriculture; we therefore say that it is *especially* applicable to steam culture, and we ground our opinion *that an alteration in cropping may be right and beneficial* upon the supposition that an almost perfect pulverization to any required depth may be obtained by the judicious application of steam-power.

Crops.—The various grain crops will progress advantageously on soils pulverized at a moderate depth. The pulse crops are benefited by a somewhat deeper culture; but the bulbous, tuberous, and nearly all esculent crops require a very deep pulverization to bring them to perfection; while many crops grown for medicinal, chemical, dyeing, or similar purposes, or, again, as oil or seed plants, require considerable variations in culture. Madder, liquorice, &c., cannot be profitably grown, unless by an unusually deep process of cultivation. To many of these last-named crops steam cultivation would give incalculable advantages.

Soils.—*Heavy tenacious clays* may, by the aid of steam, be wonderfully benefited. They may be worked at certain times and in various ways, when horse-power would be comparatively useless and could not accomplish it. The expedition required and used after rain; the absence of treading; the open light order in which some clay lands would remain after going deep under rotatory culture would enable them profitably to produce all the crops usually grown on open deep loams—this would be a great gain. These clay lands may thus be made to produce good crops of potatoes, carrots, cabbages, turnips, rape or madder, liquorice, woad, and mustard seed, besides all the corn and pulse crops.

Thin gravels may be greatly improved by this rotatory forking or digging. The prongs or diggers would penetrate more deeply, and tear up the soil in a way which the plough could not do, and would thus gradually deepen these soils, and of course render them more productive and capable of bearing many of the crops just named.

Thin Chalks.—These would undergo the like improvement with still more beneficial results. It would aid much in mingling *peat* with the underlying clay.

The greatest benefit, perhaps, would accrue to till *deep soils* and *rich* or *thin loams.* This deep intermingling of soil would surprisingly enhance their powers of production; and, on such soils, cropping of all kinds may be grown to an unlimited extent; exhaustion and root weeds may be greatly checked and kept down by this deep culture. The atmosphere, it is well known, will mainly supply the requisite or exhausted stock of ammonia if the soil is duly prepared by deep working to receive it, and root weeds cannot luxuriate under such decisive treatment. And as crop after crop, under good management, may succeed each other indefinitely, the supply of manure will be equal to every exigency; so that on rich loams and other good soils the course of cropping may, in fact, be unlimited, and may be often varied by the production of a potato, carrot, or other like crops, because these crops gather nutriment from a deeper source than ordinary

corn crops, so that in this way nothing is lost, lies dormant, or remains unproductive to the full depth of soil cultivated.

What facilities do this mode of culture also give to additional or supernumerary cropping! Take a field of early peas—these to be quickly harvested; the field immediately worked and sown to turnips, these to be fed off, to be resown with wheat. Thus, the field has produced two crops in one season, and again in progress for another—the horse-power being engaged in other departments.

Having therefore named the above for the consideration of our readers, we would further, for a moment, allude to the revolution which the attainment of this great desideratum, viz., the power to affect deep and thorough pulverization on almost all soils, will cause in British agriculture. It will bring into active productive operation much valuable soil lying inert near the surface, and never hitherto brought into co-operation with it. Bringing this up is like increasing the area of every field. It will be effected at less cost than common culture as now practised, and it will allow, without damage by rains, more continuous working than with horses. It will leave the soil or field sown to any crop free from treading or hurtful compression; so that every particle may be open to receive the expanding rootlets, and where every fibre may find its crevice, in which to seek and gather its food. It will open, as we have said, new and extended courses of cropping, to which we think there need not of necessity be any limit. We augur much on this point; it is the great point. Deep culture being attainable at a moderate cost, cleanliness will be found indispensable to unlimited cropping; unlimited cropping will of course entail replenishment of the soil; this will cause artificial aids of every kind to be sought after; and as few or none exceed the use of cake or corn as food for cattle, sheep, pigs, &c., and to improve the foldyard manure, it follows that meat will be produced in greater abundance, in conjunction with grain. This must under judicious management improve the land and increase the produce. The greater the improvement, the more fertile is the land. There is nothing utopian in these broad assertions: we can point to many farms where this is going on truly, and in various degrees. We want such management to become universal, and we say that as the means are at hand, it will be unpardonable to neglect their adoption. The country demands it. The population require of us much. They demand food at a cheap rate. The age in which we live demands it. All are looking for some grand movement to enhance production and cheapen produce. No obstacles must be thrown in the way. Antediluvian leases must be unknown. Farmers "must be up to the mark:" nothing in the shape of a real improvement ought to escape them. They must prove themselves equal to every exigency, and, if possible, be in advance of the times; at all events, not behind them. An ignorant farmer, in these days, should, and, we trust, will be a nondescript; and a fettered farmer must hereafter consider himself a serf.

"THE NEW AND ADMIRABLE ART OF SETTING CORN."

Such is the title of an old pamphlet, published about the beginning of the seventeenth century, and now to be seen in the reading-room of Her Majesty's patent-office (thanks to Mr. Woodcroft and his brother commissioners). It is an anonymous production; but the author was obviously well known at the time, and familiar with the different works on agriculture then in circulation—Greek, Roman, and French, as well as English. He also appears to have been the author of more works than one, reference being made to his "Book of Husbandry, printed anno 1594," for the examination of more ample details on topics not falling legitimately within the compass of his pamphlet, the contents of which are given thus:—

"1. How this invention began. 2. The reason why corn doth shoot up into so many ears rather by setting than sowing. 3. The manner of digging and laying of the arable grounds in this practice. 4. The several instruments for making the holes for the grain, and covering them. 5. At what depth and distance your corn must be set. 6. Whether it be good to fill the holes with common earth, and to prepare the seed before it be set. 7. How to make choice of your seed. 8. The difference of yield between the plough and the spade, with some new addition to the plough."

These he discusses separately, quoting French and Roman authors with all the ease of a master teacher. The work, it will be seen, is on seeding, by means of dibbling, in preference to broadcast sowing, and digging or forking the land, in preference to ploughing it; and the advantages gained are pointed out with great circumspection and impartiality, and also with all the confidence of a modern amateur in the value of the information conveyed to his readers.

On the first, he states that he believes the practice of dibbling corn, or, as it was then called, "setting corn," was known to the ancients. He expresses a complimentary wish that England had been able to lay claim to the invention, but regrets he cannot award it to her; but hopes she will not fail to embrace it, thereby benefiting by the over-flowing harvests it is calculated to confer.

Under the second head, the reason he assigns for dibbled corn tillering more than broadcast-sown is, that

because the seed in the latter case lies too near the surface, and therefore "either the inward *Balsamum* is washed away with the moisture, or nipped with extreme cold, that it cannot possibly send so many spring stalks and ears as naturally it would." On the contrary, he argues that, "when as the corns of wheat shall lie so deep within their true and natural bed, even their own mother's belly," as is the case when dibbled, we have the opposite result—a plentiful harvest.

3. The manner of digging with the spade, he briefly disposes of as a trivial affair, "known to every country Coridon," and therefore not a fit subject for a "scholar's pen," consequently he refers his readers to the beaten tract of practice; and he also concludes that the laying of the ground into ridges to keep it dry can be best determined by the farmer. In this chapter he places considerable importance upon the influence of the sun, which, he says, seldom penetrates deeper into the soil than two feet. He also notices the depths of different soils, and the quality of substrata, and that farmers were in the habit of digging from one to two feet deep.

4. Various kinds of dibbles, it appears, were, at the date of the pamphlet, in use. These the writer describes with graphic accuracy, and even speculates a little as to the thumb and finger being the first dibble ever used, on the plea that "hands were made before knives." But be this as it may, the author recommends a board with one or two rows of pegs on the under side, and a handle on the upper, analogous to those now used for potatoes, dibbling-in manure, &c., &c., soil and circumstance determining the length of the pegs, and distance between them.

5. In this chapter the writer wisely avoids laying down arbitrary rules as to depth and distance. On the contrary, he affirms that in all cases these ought to be determined by experiment. He, however, gives it as a general rule that on no account is the seed to be placed on the cold subsoil, but "within the rich crust of the earth." Several interesting examples are given, from Kent, Northamptonshire, &c., as to produce per acre. "Three inches deep by three in distance," he says, "hath brought forth thirty quarters of wheat upon an acre of ground;" and "4 × 4 only 20 quarters:" which is rather in favour of thick seeding. But he shrewdly adds, "the ground or the seed might have accounted for the difference." In the seventh chapter he says that twelve pints of picked seed will set or plant an acre; which states the author's views on this topic without ambiguity.

6. The sixth head offers a wider field for discussion, and the author enters upon it accordingly. The question not only embraces the preparing, or steeping of the seed, and covering it, but also the manuring of the land—subjects which have in all ages engaged a good deal of controversy, and that at issue does not appear to have been an exception. Where the earth is sufficiently rich, it may be as profitable to cover the seed without manure; but where the soil is in the opposite state of fertility, manure had best be used. And here a long list of fertilizers is enumerated, including the dung of pigeons, sheep, cows, &c.; then follow sea-weed, woollen rags, dregs of beer or ale, soot, nitre, horn shavings, soapers' waste, malt dust, hulls of oats, ashes from iron-works, and "sal amoniake;" which last, "rolled in common earth, works wonders," we are told. With regard to the preparing or steeping of seed, he refers to the lees of oil used by the Romans, quoting Virgil's "Georgics," and also to brine, solution of arsenic, and various other nostrums then in vogue; and concludes by recommending the steeping of seed in the liquor from dunghills 24 hours, and then drying it thoroughly before sowing. When sown wet, the result, he says, is not so favourable.

7. In this chapter the pamphlet advocates strongly the careful selection of seed, recommending that seed wheat should be picked, grain by grain, from the ear, where farmers can possibly spare the time; and when this cannot be complied with, suggesting several less effective plans. He says, when seed is picked grain by grain carefully, twelve pints will plant an acre, as already quoted, owing to the number of shoots which each sends up.

8. The author, we learn briefly from the last head, prefers the spade to the plough, but is anxious to give the latter every manner of fair play. The yield, however, he says, is never so great after ploughing as digging, and the difference will do far more than cover the increase of expense; so that, at this early period, the doom of the plough was plainly recorded as the work of a little time.

Such is a very imperfect review of this little work, upwards of 250 years old. The facts to which it directs attention prove that at that time the farmers were engrossed with many of those practical questions which still agitate and divide the agricultural mind; and that, although far behind in chemical and mechanical science, the distance between us and them, or the progress we have made, is hardly compatible with so long a period of time, or what other 250 years may place between us and our posterity.

EFFECTS OF GREEN CROPS.—The proportion which green crops bear to each other with respect to weight of produce, and also in respect of exhausting the soil, if it be drawn from the weight of vegetable substances that is raised from the land:—

Mangel wurzel	25	Kohl rabi.....	14
Cabbages.....	25	Swedish turnips	13
White turnips	16	Carrots.....	11
Potatoes	15		

This mode of judging is quite opposite to the commonly received opinion. By taking the weight of nutritive matter which is produced from a given space of ground, as the standard from which to judge, the results are very different, and will be found to agree with daily experience, or at least the common opinion:—

Potatoes	63	Kohl rabi.....	17
Cabbages.....	42	Swedish turnips	16
Mangel wurzel	28	Common turnips,...	14
Carrots.....	24		

AGRICULTURAL STATISTICS.

The Select Committee of the House of Lords appointed to inquire into the best mode of obtaining agricultural statistics from all parts of the United Kingdom, in its report to the House, recommends:—

1. That the systematic collection of agricultural statistics throughout the United Kingdom is an object of national importance; and that amongst the many classes that would benefit by it, none would derive greater advantage than those connected with agriculture.

2. That it is expedient that powers should be given by Act of Parliament to compel the occupiers of land to make the necessary returns, in case of their neglect or refusal to do so.

3. That the Board of Trade should be entrusted with the general superintendence of the collection of the statistics in Great Britain, through the medium of the Poor Law machinery in England, and the Highland Society in Scotland; and that the Irish Government, in continuing to superintend the collection for Ireland through the agency of the constabulary, should from time to time consult with the Board of Trade on the subject, for the purpose of securing as much uniformity as possible in the returns obtained for the different portions of the kingdom.

4. That two classes of returns should be annually obtained—the first containing facts, and the second estimates; and that the facts should consist of returns of live stock, and of the acreage under each description of crop, while the estimates should consist of estimates of the produce of the harvest. The acreage and stock returns should be sent in by the 15th of July, and the estimate returns made up between the 1st and 30th of November.

5. That the schedules to be employed (and which should be introduced into the proposed act of Parliament) should be sufficiently comprehensive, but that power should be given to the Board of Trade to omit any portion of them on any particular occasion; and, on the other hand, to modify them as circumstances may show to be desirable. The schedules employed in the inquiry of 1854 will form an appropriate basis for the permanent schedules.

6. That the inquiries should not be required to extend below holdings of two acres in England and Wales.

7. That the parochial rate books should be at all times accessible to the properly-qualified officers employed in the collection of agricultural statistics.

8. That the requirements of the act for taking the corn averages should be more strictly carried out by the local officers entrusted with their prosecution than appears to have been the case hitherto, and that the list of towns from which the returns are made should be amended.

9. That as the collection of agricultural statistics is a matter of national interest and utility, it is reasonable that the expenses connected therewith should be defrayed out of the national exchequer.

10. That it is desirable that the Government should introduce a bill into Parliament as early as possible, for the purpose of carrying into effect such of the above-mentioned recommendations as may require the intervention of the Legislature for their due execution.

The principal commercial value of such statistics is to get a knowledge of the harvest of each year; but all the Lords aim at, on this point, is an estimate—an approximation to the yield, which is now very generally obtained by private inquiries, if not obtained uniformly and by reliable means. As no discoveries made by such contrivances could now, we presume, induce the Legislature again to meddle with the supply of the people's subsistence, these returns, however useful and curious the information they might supply in other respects, are not likely to subserve any legislative purpose. Nor is the object of procuring them at all legislative. It is, we think, entirely commercial—that of ascertaining the quantity of agricultural produce, with a view of determining its relative value to other things. The desire to obtain such returns arose less, however, in commercial men, though they are sensible of the value of accurate statistics of all kinds, than in agriculturists. They and their friends believed that, from an over-estimate of the crop at one time and an under-estimate at another, they were induced to part with their goods at too low a rate, or to hold them when they ought to sell, till importation was effected, which lowered the value of their stocks.

It was very generally supposed and asserted that the farmers, from their ignorance of the quantities they generally grew and of the wants of the country, were made the victims of what is called commercial cupidity; and it was further supposed that an accurate estimate, or even an approximation to an accurate estimate of what they grew, would save them at one time from holding over their crops, and at another from hurrying to the market to their own injury. This is, we believe, somewhat a mistaken view. The farmer is really a great adventurer in Nature's lottery. He makes himself responsible for rent, tithe-rent charge, poor-rates, and taxes; he buries much money in seed corn, young cattle, and labourers' wages, and trusts to the seasons for repayment. In the long run he is a great gainer. Nature rewards no industry more bountifully than the industry of the husbandman; but every Michaelmas finds him under great advances or great obligations, and generally a great debtor.

The seasons are never equally favourable to all farmers; but, be they bad or good to the individuals, as the rule, all are obliged to sell. They must even hasten to market when the harvest is reaped, in order to fulfil obligations; and as, against individuals, the seasons, or the produce of single farms, is frequently unfavourable, they are frequently unsuccessful. They generally grumble. They all venture deeply, but do not all always draw prizes. In the meantime, however, the capitalist or the merchant stands with his cash at his command ready for action. It is his business to watch the market, and buy when they are cheap, and sell when they are dear. He takes advantage of other men's necessities. He plays, as Lord Bacon has long ago described, at certainties, while those who are dependent

on the seasons or long sea voyages, &c., are at uncertainties, and in the end the advantages are on his side. But, in the present condition of society, his functions are essential to the healthy performance of the general functions. If he be, according to the old fable, like the all-devouring stomach, like that he is necessary to life. Without the capitalist the farmer would find no regular market, but would be at one time devoured, as it were, by hungry people, and at another get nothing for his too abundant produce. The capitalist is like a fly-wheel, essential to the machinery of regular productions, though he have the farmer at an advantage. If this be so, he must, as the rule, dictate his own terms to the farmer; otherwise he will not deal with him. From this relative condition, which we regard as unavoidable, the best statistics cannot relieve the farmer, nor make his position one atom better.

So far, therefore, as it is supposed that correct agricultural statistics would relieve the farmer in the smallest degree from his natural disadvantages, the supposition is a mistake. The best statistics will neither help him nor serve any good legislative purpose. Their value, therefore, like the value of many other non-existing but fancied things, is, we believe, much over-rated. Let us have them, however, by all means; let them be made compulsory, as the lords propose; and let the community be taxed to pay for collecting them. Only by "proving all things" can we learn their value. Let us have a compulsory system of agricultural statistics: they have such a system on the continent. Englishmen at present are unable to form a higher ideal of political excellence than exists in continental practices; they are by all great writers and thinkers—political, military, and scientific—continually held up to our admiration and imitation: let us follow them in procuring agricultural statistics too, as is recommended by the Lords; and if the establishment of means to collect them be not also followed by imitating the continental practice of bandaging the people's eyes and tying their tongues, we shall soon learn the value of the system. We have little faith in its promised utility, but wish it to be tried.—Economist.

CORN SUPPLIES FROM THE SPANISH PENINSULA.

Some time ago, while repudiating the old theory of "war prices" as an immediate result when war broke out with Russia, we admitted that supplies would be affected the second year, but that new resources would spring up, more redundant than those of the above empire, ruling prices accordingly. Since then our conclusions have been realized. Prices have, no doubt, ruled high, as we then anticipated—a result accounted for from the deficient crops of the United States last year, and partly, perhaps, from our transatlantic cousins, like too many of ourselves, indulging in the delusive hope of a peaceful solution of the Eastern question through the mediation of Austria, and consequently not making that extra provision for the demand upon their breadstuffs which they ought to have done; but those delusions are now gone, and every wheat-growing corner of the world is preparing supplies for England—supplies which are likely not only to exceed those of Russia, but, from the greater diversity of climate, to be more uniform both as to quantity and quality.

As a source of supply, our colonies have always the first claim on our attention. That they—as well as the United States of America—are capable of meeting all our wants, were their industry and that of the mother country applied in the most judicious manner for their mutual welfare, is a proposition which almost requires no proof; for it would be absurd to suppose the contrary — that under such circumstances Englishmen, with their millions of fertile virgin soil, could not grow plenty for themselves, and to spare. In practice, however, it is no easy matter complying with such circumstances; for so long as capital is amassed in the mother country as it is, and capitalists interested in cheap labour—in other words, opposed to the most healthy state of colonization—the joint industry of both cannot be exercised for the mutual interest of the public. So long as both remain in this state, the manufacturing towns of the one must submit to dear bread and a surplus population, and the other to uncultivated virgin acres. In short, the beautiful theory involved in our proposition just means no supply at all; but that our surplus population, or those for whom English acres cannot grow bread, shall emigrate, and grow bread for themselves in a land of overflowing plenty. That we are progressing nearer and nearer to this conclusion, and that England and her self-governed colonies—each now a prosperous state by itself—are preparing to act for the mutual independence of each other in every respect, is a proposition also susceptible of easy proof; and the very fact that the latter are now endeavouring to supplant as much as possible our imports from Russia is the establishment of the necessary means to such an end.

England, however, and her prosperous colonies cannot enjoy in their present conditions the benefits at issue, to the exclusion of the rest of the world, but the contrary — their obvious destiny being the extension of their own privileges to every other state. At the present moment, for example, almost every nation of Europe, Asia, and Africa look to the English race for civil and religious freedom, with the numberless blessings which follow in their train; and there can hardly be a doubt, that in spite of the united efforts of arbitrary governments for universal sway, they are not looking in vain. Now, dropping the religious view of the question, the work of reformation already begun in the Peninsula of Spain, if properly concluded, will of itself alone result in large supplies of corn. How, therefore, can such a work be best promoted? and here the answer is obvious, viz., the introduction of railroads and our improved agricultural implements;

the latter to cultivate the soil, and the former to convey the produce to some export town. Even with the rude implements already existing, Spain last year could have sent us large supplies of wheat, had the means of transporting them to the seaboard existed. A very superficial glance at our own free-trade measures, and the revolution and reforms in the Peninsula, will readily convince our readers that this is the direction in which the progress of things is pointing; and that the more distant and frozen regions of Russia cannot supply us with so cheap corn as Spain and Portugal.

The best proof of the soundness of this conclusion is the fact that the Spanish Peninsula has corn to spare, proving its agricultural position: and neither her overgrown ecclesiastical establishment, nor the still greater barrier of an ignorant people, can stand in the way of its onward movement. The light of physical science can no longer be excluded from this one of the richest territories of the habitable globe; but having once broke in upon its benighted inhabitants, it cannot fail of ultimately exhibiting to the rest of the world its productive capabilities; and from the commercial position which England occupies, her demands for bread-corn will doubtless not be neglected, or the isolated position into which Russia has placed herself overlooked; on the contrary, both Spain and Portugal will benefit by the present commercial rupture which has taken place between Russia and the Western Powers, and which, in all probability, from the unbending character of Muscovite aggression, will endure for some considerable length of time.

The duration of the war is, doubtless, a weighty consideration—a point on which no small amount of misapprehension exists. It has, for example, been the misfortune of too many to dream of a Vienna peace, which, granting that the four points had been agreed to, would only have placed the Danubian Principalities in Austria's hands in a very few years, and the rest of Turkey in those of Russia; and which, consequently, would have been no peace at all. The permanent settlement of the Eastern question involves the extension of those civil and religious privileges in the dominions of Austria, Prussia, Russia, and Turkey, which the English race enjoy. To suppose that the inhabitants of those kingdoms will accept of less, is not more absurd than to suppose that Englishmen will return to the priest-ridden slavery of the middle ages. A temporary peace would no doubt procure from Russia and the Danube a temporary supply of corn; but this is not what the English people require; for our limited area of land and increasing population demand a steady, permanent, and increasing supply. Now, the extension of those civil and religious privileges to which we refer involves not merely the downfall of Islamism, but also the ambition for universal sway of both the Roman and Greek Churches. Both these churches, for example, must relinquish their claims to the "Holy Sepulchres" of Jerusalem, and everything of this kind, before we can hope for a permanent settlement of the Eastern question; and this, we fear, is a work of longer duration than many imagine, since it involves the downfall of every arbitrary government in the world. No peace, therefore, based on the "Four Points," or which falls short of English freedom, ought to stand in the way of this country endeavouring to procure immediately from the Peninsula of Spain an increased supply of bread corn.

The work of improvement already in progress, and the length of time involved in the permanent settlement of the Eastern question, are both, therefore, in favour of England cultivating an increased connection in the corn trade with Spain and Portugal; and in doing so she has only to reciprocate with them, transactions being as much in her favour as in theirs. No doubt neither of them is yet in a very satisfactory state for the safe investment of capital; but a very cursory glance at the Peninsula, and its political circumstances at present, will suffice to show that obstacles of this kind may soon be easily overcome.

There is, for example, no country in the world that holds out to England greater prospects of an increased commerce than does the Spanish Peninsula, whether we consider its situation or products. Just emerging from a state of political darkness, which we shall not attempt to describe, there cannot be a doubt but the industrial and physical circumstances of the country are about to expand, and that a more prosperous era in the history of its agriculture and commerce has already commenced. In the hands of Englishmen, how soon would railroads, improved agricultural implements and machinery, breeds of cattle, and systems of husbandry be adopted, even had we no more capital than the inhabitants of that country possess. And what other course can Spaniards and Portuguese follow? At present the whole Peninsula is almost devoid of internal communication for the removal of its produce and the introduction of improved machinery and breeds of cattle; for, although the rivers are large and numerous, they are seldom navigable to any great distance into the interior; and even this distance, short as it is, is almost useless, from the entire absence of roads and canals intersecting the country. Although well accommodated with navigable rivers, our colonists in North America cannot grow corn with advantage until they have railroads for its removal to shipping ports. Hence the immense length of tramway now laid in that country; and the same means are required in the Spanish Peninsula.

Its warm, dry climate, again, and abundance of rivers, hold out prospects of immense returns from a more judicious system of irrigation and liquid manuring. How many portable steam-engines, for instance, could be successfully kept going in raising water during summer, and thrashing corn during winter? And what increase of produce would each return? We have no doubt that, in such a climate, the answer which Practice would give to this latter question would be—upwards of fifty per cent. of the price of engines yearly! Now, granting that such is fact, could not England supply the steam-engines and machinery for a fraction of the increase of produce, leaving the Peninsula farmers profit and means sufficient to grant the requisite security to companies of capitalists working some such project? That this seems practicable, and that mutual advantages

would be gained from it, far greater than has ever been realized from our corn-trade connection with Russia, requires no proof. And that the Peninsula is in a sufficiently reformed state to warrant the investment of its capital in railroads, is equally plain.

In making these observations, we are not insensible to the uneasiness now being felt in the mind of the monetary world relative to the security of the bonds of Spain and Portugal. But, in answer to this, we have only to ask, What is the unhappy position from which we have just said that those two kingdoms are emerging, but the want of that industrial enterprise, which is the cause of this financial insecurity? Let England herself be deprived of her railroads, portable steam-engines, and other improved implements and machinery of agriculture, with her improved breeds of cattle, and we question very much if even she, with all her boasted commercial wealth, could now keep faith with the public creditor; and we should like to know on what grounds the monetary world has a right to expect more of the unfortunate inhabitants of the Spanish Peninsula, now struggling to liberate themselves from the enslaving consequences, so to speak, of this non-mechanical state. What we want to see introduced into these, the most promising, but neglected, kingdoms of the world are mechanical means which would enable their inhabitants to triumph over their pecuniary embarrassments. If, for example, we could place such means in their hands as would enable them to grow and export to England some four or five million quarters of wheat annually more than they do at present, with a corresponding increase in cattle and other products for their own consumption, would not this enable them to pay for a vast amount of machinery annually, besides the regular interest of their Bonds? And if any one entertains doubts of the practicability of such an increase from such means, he has only to go backwards to England's non-mechanical state—that on a level with the Spanish Peninsula at present—and from thence take a retrospective and prospective glance at her agricultural produce, comparing the non-mechanical with the mechanical, and he will find that results are tenfold more in favour of machinery than we have just stated.

We are not advocating, however, an increase of English capital in Peninsula Bonds, but commercial reciprocation; and, therefore, the above objection of financial insecurity cannot even be raised. All that we have got to do is, to remove her surplus corn, supply her with machinery to enable her to abridge her labour, thus mitigating the enslaving hardships of working in a warm climate with inferior implements, which she now experiences, and to encourage industrial enterprise among her agriculturists, by the spread of agricultural science, so as to increase her produce. No doubt railroads must be made before produce can be profitably removed, and money raised before they can be made; but if difficulties are experienced here, paper money can be made in the shape of railway scrip, for the express purpose of making railways, and when these are formed, gradually withdrawn from circulation, to form the permanent railway shares or stock of companies who may hold them. What the Peninsula wants is not so much money as public confidence, and this will be established with the improvements at issue, and certainly no country is better qualified to exchange for corn the mechanical means of progress than England, or more loudly called upon to aid by every other means in her power the work of Reformation now going on in that fine country.

OIL AND FISH AS FERTILIZERS.

Oil is composed of the same elements as woody fibre, and, like it, furnishes, by decomposition in the soil, carbonic acid to plants. The chemical value of carbonic acid none can doubt; probably four-fifths of the dry matter of most of our cultivated plants is derived from it; and its action in rendering the mineral matter of the soil soluble is well known. But the *commercial* value of carbonic acid, or rather of substances which by decomposition yield it, is another question. The atmosphere contains an immense quantity of carbonic acid, and every shower of rain brings it to the soil. Plants absorb this rain-water, and with it the carbonic acid, which, in the organism of the plant, is converted into starch, oil, sugar, gum, woody fibre, &c. The large amount of woody fibre found in wheat straw, corn stalks, clover, the grasses, &c., is principally derived from the atmosphere. By using the wheat straw, stalks, &c., as manure, and by ploughing in a few green crops of clover, peas, &c., we can supply to the soil a large amount of carbonic acid at an exceedingly cheap rate. Possessing such an easy means of supplying his soil with all the carbonaceous matter it requires, the farmer need not, and, guided by experience, does not, buy manures with any reference to the carbonic acid they can supply to plants.

Oil, sugar, starch, gum, &c., furnish to plants the same fertilizing elements as the woody fibre of straw, clover, &c., and we do not know that they are any more valuable, except perhaps that they decompose more rapidly, and furnish more carbonic acid in a given time. Many eminent writers, especially among the ancients, attribute great fertilizing value to oil; but this is not so much to be wondered at, seeing that they called night-soil an oily manure. A few years since, oil was highly recommended as a manure for turnips in England, and many experiments were made with it. Some of them which gave favourable results were published,

and for a time oil was recommended as a substitute for bones. Further trial, however, proved it to be of little value, and it soon fell into disuse.

One of our best agricultural writers appears to entertain a different opinion from the above, for he has recently pronounced oil "one of the most powerful fertilizers yet discovered," and says one of the best corn crops he ever saw in Connecticut was manured with the "refuse of whale ships." The refuse matter most probably contained much nitrogenous matter, and therefore it is by no means certain that the benefit derived was due to the oil. Lawes has shown that turnips require more carbonaceous manure than any other farm crop, and yet in his extensive turnip experiments oil did little or no good. M. Kuhlman, speaking of his experiments with various manures on grass, says "rape-seed oil, in 1845 as in 1844, *produced no effect*."

The same writer advocates a more extensive use of fish as a manure on the sea coast; and in this we most fully concur. But as the subject of manufacturing a portable manure from fish is now receiving much attention, he will excuse us for referring to what we deem a mistake in the following paragraph:—

"As a matter of fact, these fish contain all the valuable fertilizing materials of the best Peruvian guano. That manure is simply the flesh and bones of fish digested in the stomachs of sea birds, and dried in a rainless climate. The only advantage which Peruvian guano has over the fish, is in the fineness of its particles, and in its dryness. If we had a cheap process of depriving the fish of its water, without evaporating its gases, we should have a manure at home as valuable as that of the Chincha Islands."

Peruvian guano, according to this, is simply dry fish in a finely-divided condition. This is true to a certain extent only. Peruvian guano may be considered as fish dried and finely pulverized, *with the oil and other carbonaceous matter burnt out of them.* Fish are composed of say three substances—bones, nitrogenous matter, and oil. When eaten by animals, the oil is burnt in the lungs, and expelled in the form of carbonic acid gas and water; the nitrogenous or *fleshy* matter, composed of the elements of oil chemically combined with nitrogen, is decomposed in the body of the animal, a portion of the oily or carbonaceous elements being used as fuel, and given off as gases through the lungs and pores of the skin, while the nitrogen enters into new combinations with the other portion, and is expelled from the body, together with the phosphates or bones, in the excrements. Guano, therefore, is not simply dry fish, but the nitrogenous matter and phosphates of fish.

This separation of the carbonaceous matter, and its expulsion from the body as carbonic acid gas, takes place in the consumption of all food. Nature intended that vegetables should be used for the support of animal life, and the requirements of vegetable growth are such, that the portion of plants which is *unavoidably* dissipated in the air, when fed to animals, is not needed in greater proportion than the atmosphere and the excrements of animals can supply.

Fish are not valued by farmers as highly as theory would indicate; and we have sometimes queried whether this was not owing to the large quantity of oil which they contain. Certainly the decomposition of fish in the soil would furnish the plants with a greater proportion of carbonic acid, as compared with ammonia, than nature intended. And it is in our view highly probable that if some method analogous to the process of nutrition could be discovered, whereby the oil might be separated from the fish, and the nitrogenous matter and phosphates be left in a finely-divided condition, such a manure would prove more valuable than the entire fish. A manure nearly equal to Peruvian guano is manufactured in France, by boiling fish, pressing out the oil, and drying and grinding the residuum. It contains 14½ per cent. of ammonia, and 22 per cent. of phosphate of lime. It is sold at 34 dollars per ton, and is unquestionably a cheaper manure at that price than even the *best* Peruvian guano at 50 dollars per ton. It will not do, however, to assert, as some do, that it is quite equal to it, since, from reasons which will at once present themselves to the minds of our readers, it can never be made to contain as much ammonia in a given weight. We understand a company is about establishing a manufactory in this country, and we wish them abundant success, and can see no reason to prevent it.—"American Country Gentleman."

HAIR is the dry, round, elastic fibres or filaments that arise from the skin, and are fed by the medullary juices. It is found on the mammalia tribe, and on every part of the body except on the soles of the feet and palms of the hands; and in the shape of hair, bristles, wool, scales, and spines, is found much diffused over the animal creation. Hair grows in vascular pulps, with the roots enclosed in bulb-shaped capsules, situated within the skin. It is of a horny nature, and composed of smooth lamellæ, placed over each other like zones, which increase by thrusting the parts forward as in nails, and not by a liquor flowing along the tubes as in plants. The felting property is owing to this quality in hair; and in bristles and other hairs the horny substances are arranged in fibres like the woody fibres of a cane. Hair burned to ashes has given iron and manganese, phosphate, sulphate, and

carbonate of lime, muriate of soda, and a considerable portion of silica. Gelatine is produced by boiling it, and imparts the flexibility and toughness: continued boiling dissipates the gelatine, and the remains are brittle, crumble to pieces between the fingers, and resemble coagulated albumen in being insoluble in water. White hair yields magnesia, which is wanting in other colours; and red hair contains less iron and manganese. The ashes do not exceed .015 parts of the hair. Hair is composed of—1, Animal matter, chiefly; 2, White solid oil, small quantity; 3, Greyish green oil, more abundant; 4, Iron; 5, Oxide of manganese; 6, Phosphate of lime; 7, Carbonate of lime, very scanty; 8, Silica; 9, Sulphur. The animal matters are principally gelatine and albumen, and a substance resembling both; and the operation of hair as a manure is similar to bones and horn shavings. It has been sold at 1s. 6d. per bushel, and thirty bushels have been applied to an acre, and may be covered in the land with one ploughing, or mixed with earths in composts.

WILKINS'S PLAN OF SUB-IRRIGATION.

Sir,—I have seen several notices in your journal some weeks since of Mr. Wilkins' system of sub-irrigation with liquid manure—some in favour of, and others hostile to it, on account of the expense. But neither Mr. Wilkins nor his commentators have given any detail of the expenses attending the preparation of the land, &c.; and the public are, therefore, left in the dark as to the real merits of the system, which, after all, turn upon its practicability. This, in fact, is not a mere question of the superior utility of liquid manure over other modes of application, but whether an entirely new and enormously expensive mode of applying it should be adopted; and before any one enters upon such an undertaking, it is right that they should know somewhat of the expense in which they will inevitably be involved. It is therefore my intention, in this letter, to supply the details in which in Mr. Stephenson's letter was deficient; and at the same time point out some of the evils which, in my view of the case, will be inseparable from it, and prove destructive to the crops.

The expense attending the plan will comprise, first, that of *levelling*, *displacing*, and *replacing* the ground; secondly, laying the brick floor in cement; thirdly, laying down the tiles; and fourthly, the sub-irrigation.

The expense of levelling the land will, of course, depend on the amount of inequalities it possesses; but as all lands would require to be led by a fall to one or more points of a field, we cannot reckon it at less than 3d. per rod; the displacement of the earth eighteen inches deep will cost, at least, 9d. per rod; and the replacement, after the floor is laid down, at 3d. per rod. We have, therefore, levelling 3d., displacement 9d., replacement 3d.: 160 rods at 1s. 3d., equal to £10 per acre.

Next comes the laying of the bricks. A common brick measures 9 in. by 4½ in., and therefore contains 40½ square inches. One square foot contains 144 in.; multiply this by 9 ft. to 1 yard, and we obtain 1,296 in. We must then multiply the number of square yards in the acre by this number—thus: 4,840 multiplied by 1,296 is equal to 6,272,640 inches; then divide 6,272,640 by 40½, and we obtain 154,879 as the number of bricks required, which we may reckon at 35s. per thousand.* These will require a cask of cement for every four square yards, at 10s. 6d. per cask. Probably Mr. W. may estimate merely laying the bricks, without cement at bottom and grouting them in; or he may lay them in common mortar. But I question whether, in either case, he could obtain a *water-tight* level, as he professes to aim at. I have done work of the kind myself, and never found any other plan succeed than that of laying a bed of cement for the bricks and filling in the joints with the same.

With regard to the labour in laying down the bricks, if laid in cement, it will cost 2s. per rod; or, if only grouted in, 1s. per rod; which will amount to £8 per acre in the latter, and £16 in the former case. The expense of the draining tiles will depend upon the distance at which they are placed; but as Mr. Wilkins professes to have them directly under each row of plants, they must be placed tolerably close. If we, therefore, reckon 4s. per rod for tiles and laying, we shall not be beyond the mark. This will amount to £32 per acre. Now let us see the aggregate expense of the whole; and in my estimate I shall reckon grouting the bricks with cement, instead of laying them in it. This will reduce the expense to about one-third—say 12 yards to each cask.

	£	s.	d.
Levelling, &c., the ground	10	0	0
155 thousand bricks, less 2 thousand for joints—say 153 thousand, at 35s.	267	15	0
400 casks cement, at 10s.	200	0	0
Labour—laying down	8	0	0
Draining-tiles, and laying	32	0	0
	£517	15	0

Now, let Mr. Wilkins look over this estimate (which I am inclined to think is the first, *in detail*, that he has seen); and, let him make what alterations he will in the mode of effecting his plan, he cannot reduce the expenses to any sum that will not at once show the absurdity of proposing such an alteration to a body of practical men, who understand the subject of agriculture and the operations of nature. Why, the article of bricks alone, for which he cannot find a substitute that would prove efficient, amounts, with labour, to three times the sum he has estimated for the whole.

As to the expense of applying the liquid manure, it is unnecessary to go into it; nor could I do it satisfactorily to myself: and I therefore leave your agricultural readers to make their own estimates. I confess I was both surprised and vexed at seeing Mr. Mechi's name

* The present price of bricks on the wharf in London is 40s. per thousand.

mixed up with this agricultural anomaly, as it places him in a position of questionable prudence, inconsistent with the reputation he has hitherto held as a merely *experimental* farmer, in which capacity, at great expense to himself, he has been of signal benefit to the agricultural interest.

Such is the estimate which a careful inquiry amongst practical men enables me to make of the expenses attending this plan of Mr. Wilkins'. If he cannot confute them, and produce other figures to prove his own estimate correct, or to modify mine, I adhere to my assertion, that his plan will involve an expense of *many* hundreds, instead of one hundred pounds per acre, which, reckoning the capital as chiefly sunk, and the interest at 5 per cent., will cost the farmer thirty or forty pounds per acre per annum. Our next question, therefore, is as to the advantages to be derived from this enormous outlay of capital, and equally enormous annual expense in which it must involve the farmer, whether the landlord or himself furnishes the money for it.

With regard to Mr. Wilkins' experiments, I would observe that they are all upon a small scale, and we all know the entire command which we have over the details of such experiments. We will, however, admit, for the present, that for potatoes, turnips, mangel, and many of the grasses, this plan would in ordinary years succeed. But how would it do in a very wet or a very dry season? In the former, a field with a water-tight floor within eighteen inches of the surface would be constantly super-saturated with water, especially in the winter months; and whatever plants might happen to be growing on it would inevitably perish. Mr. Wilkins will say that his irrigating tiles would carry off the moisture as fast as it fell. I doubt this; but even if it did so, the earth, by the rapid filtration, would lose the benefit of those fertilizing salts contained in rain-water, and which are fixed in the natural filtration by the chemical affinities they come in contact with. Besides which, the water, in passing through a loosened soil of eighteen inches' depth, would carry off a large portion of those nutritious particles it contains, and thus impoverish, instead of fertilizing, the soil.

But what would be the effect of this plan in a dry season? Why, that, in spite of his sub-irrigation necessarily repeated daily at an enormous expense, the whole soil would inevitably be baked to the full depth of his standard. For, observe, in such cases the natural moisture of the earth is *cut off by the floor*, and nothing can compensate for the loss of it. We know the trouble and difficulty of keeping greenhouse plants in pots in health, the constant care and attention required in watering, &c. *They*, like Mr. Wilkins' water-tight floor, are debarred the natural moisture of the subsoil; and we see the difference between *their* growth and those of plants placed in the open garden. I assert, without hesitation, that, in a dry season, the sub-irrigation must be repeated daily to be effectual, and that the enormous expense of such a process would of itself, independent of the original outlay, be more than the extra produce, if any, would warrant.

I have admitted that root crops and some grasses would succeed under this system, and probably hemp and flax, which are in a great measure surface plants. The expense, however, in laying down the floor would be an effectual bar to its adoption on an extended scale, it not being possible that the extra produce of these would be adequate to it; and as to cereal crops, which we presume Mr. W. does not mean to exclude from his system, I am certain it would not succeed. Take wheat, for instance, which strikes down with a tap-root into the subsoil, and draws from it a large portion of those substances which give strength to the straw: I have seen the tap-root of a plant of wheat six feet in length, and many others from eighteen inches upwards to that length. Wheat may be called the "oak of cereals," for like that tree it throws out both lateral and vertical roots; and if the latter are obstructed in their progress downwards the plant suffers, for the very object for which it thus strikes downwards is to seek a firmer and stronger soil than it finds near the surface, and no artificial means can supply the want of it. But Mr. Wilkins' plan will cut off this supply, and confine the plant to the loose soil on the surface, rendered more loose by the operation it has undergone in the process. The same may be said of other cereals, and I suspect also some of the grasses, notwithstanding Mr. Wilkins' experiments. Lucerne, for instance, on a light soil, strikes an enormous depth. I have myself traced one which penetrated nearly to the bottom of a deep gravel-pit, to seek for the underlying marl. Mr. W. also has made a great error, in order to enhance the value of his plan in the case of lucerne. He says he cut three crops in the season to one in the common way of culture. I have never known *less* than three crops of lucerne in a season, and have known *four* cut. Does Mr. W. mean to say that he has cut nine crops against three, or is he ignorant of the peculiar productive powers of lucerne under the ordinary modes of culture?

There are other casualties to which this plan would be subject—such as the bursting of his brick floors by the swelling of land-springs in a wet season, severe frosts, &c.; but I have said enough of the disadvantages to prove its inapplicability on an extended scale. In gardens—where expense is not an object, and where the whole arrangement is under immediate inspection and control—it may succeed so far as to grow the usual garden produce; but even here I question whether the liquid manure would not succeed quite as well upon the usual plan, if judiciously applied.

Yours, respectfully,
AN OLD NORFOLK FARMER.

London, 1855.

THE COVERING OF THE RIPE FRUIT.—The tuber of the potato, the ripening apple, and the growing twig, present us with another illustration of special chemical changes proceeding continuously in the plant, and with a definite reference to a specific and useful end. The unripe potato, when taken from the earth, withers and shrivels, becomes unsightly to the eye, and vapid to the taste; the unripe apple shrinks

in, refuses to retain its natural dimensions, and cannot be kept for any length of time; while the unripe twig perishes amidst the chills of winter, and remains black and dead, when the green buds of spring were expected to enliven its surface. These effects are the consequence of the thin bark, which covers potato, apple, and twig alike, not having attained its matured composition. While unripe, this coating is porous and pervious to water, so that, when removed from the parent plant, tuber, fruit, and twig all give off water by evaporation to the air, and thus shrivel and shrink in as I have described. But when ripe this porous covering has become chemically changed into a thin impervious coating of cork, through which water can scarcely pass, and by which, therefore, it is confined within for months together. It is this cork-layer which enables the potato to keep the winter through, the winter pear and winter apple to be brought to table in spring of their full natural dimensions, and the ripened twig to retain its sap undried, and to feed the young bud when the April sun first wakens it from its winter's sleep.—Professor Johnston's Chemistry of Common Life.

ROUGH NOTES OF A TOUR IN IRELAND.

Sir,—Since various causes opened up Ireland as a field for English and Scotch capital and skill, several small works have been published, detailing in glowing colours the various advantages the Emerald Isle presented to the British agriculturist. Thinking that seeing is believing, I determined, with a friend, to visit this "land of promise." Accordingly, about two months ago, I landed for the first time in Dublin. After looking through the town, and obtaining some further introductions, we proceeded on our tour. We visited first the county of Louth, to see a Scotch gentleman who has recently taken a farm there: much of the land between Dublin and Drogheda seemed, as seen from the railway, to be stingily farmed, and in want of draining. Returning to Drogheda, we proceeded by car south-west through Meath, to visit a new covered home stead, erected near a village called "Duleek:" the land we passed through was very fine, mostly in pasture: the hawthorn hedges grow here in great luxuriance. The homestead we went to see was planned and erected by a Mr. Maxwell, a Scotch architect; and it certainly is the first of its kind we have seen or heard of. The barns, granary, &c., are to the north—all in a straight line, and under one range of roof; and at right angles to them, running to the south, is a series of four roofs supported on iron pillars—the outside walls being of stone. To the east, half of this covered space is divided into stalls for sixty feeding cattle, with feeding passages in front, &c.: the lines of stalls run east and west: down the centre of the space is the main feeding passage, leading from the boil-house which is at the back of the barn. The other half of the building is occupied by a 12-horse stable, divisions for upwards of forty young cattle, implement department, steward's kitchen, and sleeping room, &c. The barn department is fitted-up with capital and simple machinery by Mr. Maxwell, and corn-bruiser and chaff-cutter—the whole being driven by a water wheel. The dung house is outside to the east, it is sunk 6 feet below the general level, and the liquid manure tank is 7 feet below the level: it is between the main building and the dung house, and is of great size. The whole minor arrangements are excellent, particularly the ventilation. The steading is for a farm of 600 acres of first-rate land, worked on the mixed system of husbandry; and yet the whole accommodation, except the dung house, is contained with ample room, in a space of about 114 feet by 80 feet, and the total cost is about £750 or £800. The corn crops are all to be put into Dutch barns on a line with the thrashing barn, but not quite close to it. The whole thing is the most complete, substantial, and economical that could be desired; and the principle might be adapted to a farm of any size. From Duleek we proceeded to the west, along the banks of the Boyne to Kells, a small but neat town. The land along this road is of the very finest quality: with the rich-looking pastures, fine hawthorn hedges, and well grown timber, it has a luxuriant appearance, hard to be surpassed by any country in the world. The rents here were said to be high, but the only rent I heard fixed was 50s. the Irish acre, about 30s. the statute, which I consider as decidedly cheap for the land pointed out. From Kells to Athlone through Westmeath, the land, although good, is nothing to be compared to that in Meath—much of it wants draining and management. Hundreds of acres have apparently never been turned up since "Adam delved and Eve spun;" and yet the land did not appear to be too fine to break up. We met upwards of 2,000 cattle coming from the Spring Fair at Ballinasloe, to fatten on the pastures of the Meaths: they were strong, healthy-looking cattle, but rather rough as to shapes. Were I a Westmeath farmer, I should prefer to break up some of the inferior grass-lands, and raise well-bred stock to fatten on my fine pastures; there being a wonderful difference between the time and quality of feeding in a rough and a well-bred ox. From Athlone to Ballinasloe, the railway crosses an extensive tract of bog, being part of Roscommon. The land about Ballinasloe is generally poor, and not well farmed. From Ballinasloe to Banagher, on the banks of the Shannon, we passed through a large estate recently bought by Mr. Pollock, a Scotch gentleman, who is carrying out improvements on a most extensive scale; and certainly they are much wanted. The land is very fair; and, under its present spirited owner, it will soon be a fine and valuable property. Much of the land on the banks of the Shannon, and part of Lough Derg, appeared from the deck of the steamer to be very fine; and from Killaloe, at the foot of the Lough, to Limerick, it was also of good quality, but much in need of draining and good management. Limerick appeared to be a very second-rate town, with nothing attractive except the ladies, who certainly may vie with their sisters in any town in the kingdom. To the south of Limerick, to Charleville, there is much good land, some of first-rate quality; and several farms held by Scotchmen are well farmed. The rents here were from 30s. to £2 per Irish acre. At Charleville, we entered the county of Cork. The land for some distance is very good, but does not improve as we approach Mallow. With few exceptions, it is badly farmed, dirty, and wet. From Mallow to Killarney, the best land is but middling, and much of it very bad, and in a most miserable state of poverty and wretchedness. The far-famed Killarney has a climate and richness peculiar to itself. The well-known lakes quite come up to the descriptions of them; and, singular to say, in some points far surpass anything the guide-books have said about them. Returning to Mallow, we proceeded south to Cork. The land here, although not of fine quality, appeared kindly, and, if drained and improved, and well farmed upon the Northumberland course, with sheep and

cattle, I have no doubt would make a fine district. Near Cork, at Blarney, there are several farms held by the owner, a Mr. St. John Jefferies, which have been improved, and are in first-rate order. Cork is a good town; and there was more business going on than in all the towns I passed through from Dublin to Cork, put together. Returning by rail to Charleville, we passed through a splendid country, by the town of Tipperary, to Thurles; but it is in a most deplorable state, wet, and full of weeds, some of it bearing the appearance of having been scourged, and the whole worse than not fenced; for the earth divisions, which are perfectly useless, would only be a great extra expense in removing when proper fences were put up. I was much astonished at an objection to draining and cleaning the land given us by a farmer in this part of the country. He assured us that if the land was drained, and the rushes, flags, and water-weeds destroyed, there would be a great falling off in the yield of milk and butter; and in support of his opinion, he referred to the experience of a gentleman in Cheshire, who, he told us, he knew had destroyed his best dairy pastures by getting rid of the water-weeds. I am always averse to opposing the peculiar practices of a district, founded upon experience; but really this is hardly to be believed or approved. But there seems to be a favour for weeds in this country. In a walk, the other day, in the neighbourhood of Dublin, I observed several fields which would be a disgrace to the most poverty-stricken country in Europe. Hardly two miles from town, they were commencing to cut a meadow, which for weeds surpassed anything I have ever seen. I began to question a labourer about it, when he assured me some of the weeds were not bad feeding, and that the owners approved of them, as they got a bulkier crop. Now, if weeds are to be grown, by all means do it properly: let so many acres be set apart for different weeds; and let the advocates of this original idea of feeding value test them fairly, and see whether they are really worth the good grass whose place they occupy: but, in the name of good husbandry, do not let us have the farm a mass of weeds, for the very doubtful advantage of having a third of the hay crop composed of them.

From Thurles across to Kilkenny there is much fine land, which, with good farming, would be highly profitable. The rents varied, as far as we could ascertain, from 30s. to 42s. the Irish acre, or from 19s. to 26s. the statute acre; and some of it as fine land as ever a farmer need wish to plough. The country about Kilkenny is fine, and seemed to be in great part well wooded and pretty: the town is a pleasant country place, but going greatly to ruin. A great many houses are closed and dilapidated; and some of the churches, both Catholic and Protestant, are in a very discreditable state of neglect. From Kilkenny to Dublin the land varies much—some of it being very good, and other, again, very indifferent. But all along this line there are fine districts for a farmer to settle in, if he could get a farm at a fair rent.

Having now given an outline of the route I took, I will conclude with some general remarks of things that struck me. The first and greatest inconvenience to a tenant-farmer wishing to settle in Ireland, is the very general want of any farm buildings, or if there are any, they are very frequently insufficient and incommodious. And I would advise no farmer to take a farm without making arrangements that proper buildings should be put up with as little delay as possible; for in Ireland the landlords are not unwilling to give leases of considerable length, and with the several "Land Improvement Companies" there can be no reason or excuse for not building, as the tenant, if an enterprising man, would agree and could afford, upon much of the land in Ireland, to pay the yearly interest required by the companies, if his lease was of a sufficient length. Draining is the next thing a farmer would have to contend with, but there are many districts which do not require it. The expense, which in most cases would not be a light one, and which the farmer must bear all by himself, is the cleaning the land and getting it into proper condition. The stranger would, of course, look well to the poor-rates, which are yet very high in some districts. But we should advise any farmer, coming to look out for a farm in Ireland, to consult one of the Scotch land and estate agents, of whom there are, I believe, two or three in Dublin, as he will find the classes connected with land in Ireland frequently rather unsatisfactory people to deal with, unless he knows them. A Scotch gentleman, Mr. Miller, who has, I believe, offices in Edinburgh and Dublin, is well known in Ireland as having made numerous and large purchases of land here for English and Scotch capitalists, and he has always a number of farms upon his list, of which he, I believe, arranges the leases, &c., and free of expense to tenants. There is not the same chance of cheap farms in Ireland now as a few years since, but still for enterprising men there is yet a large and profitable field; and the people now are quiet and thankful for work. They are very intelligent, civil, and obliging; and, notwithstanding that they get often a bad character from the better classes of their own countrymen, I am convinced they would, if properly educated, managed, treated, and fed, make the finest peasantry in the world. For my own part I should have no fear of carrying out every operation of improved modern agriculture with Irish labourers. They are accused of being lazy; and so they are: but it is their treatment that has made them so. Lodged in ruinous hovels, badly fed, worse clothed, and if employed not sure of getting paid for their work—such has been their treatment. Laziness and the increase of the population have been encouraged by the con-acre system and the easy growth of the potato, which when it failed, brought, of course, redoubled misery upon an over-abundant population, unaccustomed to work much for their bread.

The live stock in Ireland is generally good; the horses are light, active, and hardy, and well-adapted for their work. If they were attempted to be improved, I would prefer doing it with the Suffolk sooner than the Clydesdale horse. The cattle offer more room for improvement: they are too frequently rough, hard beasts, of what a famous Aberdeen flesher and cattle-shipper calls "clipper build." The Irish farmers are not so ready to acknowledge this, as with their open winters cattle do well when growing, and their pastures are so rich that even a bad beast fattens quickly. The Irish sheep, a frequent cross of the native with the Leicester, is not to be surpassed in any country. Agricultural improvements are beginning to be numerous and extensive in Ireland, and it is moving on visibly to take the place it ought to occupy in the rank of agricultural countries. But there seems to be a spirit abroad, which must be seen with regret by all well wishers of Ireland, and of which no calling could and should be freer than that of agriculture: and that is the spirit of party and personal pique. I sincerely trust that Irish agriculture may soon get rid of this unseasonable glimpse of the cloven hoof of party spite and faction, and continue to advance, as it is well able, on the road of improvement and progress.

G. B. BLANC.

GREAT REAPING MACHINE COMPETITION AT STIRLING.

This competition came off on Aug. 30th, on the adjoining farms of Stewarthall and Muirton, tenanted respectively by Mr. Forrester and Mr. MacLaren. The interest excited was not of course so great as in former years in consequence of this being the third competition that has taken place here, and from the fact that no new machine was on the ground. The place selected for the competition was exceedingly convenient, and very nearly the same as the ground that was travelled over last year. The crops in general were good, but if anything too ripe. This was especially applicable to the barley, which should, we think, have been cut nearly a week ago. The most noticeable feature of this year's trial was that no new machine was entered for competition, there being only the three distinctive principles represented, namely, Bell's, Hussey's, and M'Cormick's. These were of course varied by the different exhibitors, but no new principle was brought out. Eleven machines were entered for competition last year, while this year only eight made their appearance. These were as follows:—

1. Crosskill's Bell.
2. M'Cormick's, improved by Lord Kinnaird, and made by Burry of Mylnefield.
3. Dray's Hussey, exhibited by Mr. Forrester, Stewarthall.
4. Dray's Hussey, exhibited by himself.
5. M'Cormick's, exhibited by Mr. Alexander, Taylorton.
6. Dray's Hussey, exhibited by Mr. Maclaren, Craigton.
7. Dray's Hussey, exhibited by Mr. Mackie, Kersepatrick.
8. Bell's, exhibited by Mr. M'Queen, Arnhieve.

It will thus be seen that the principles best represented on the field was that of Messrs. Dray and Co., who are the makers of Hussey. This probably arises from the fact that this machine is the favourite in this locality among the farmers; and three of them exhibited their own machines.

1. Crosskill's Bell. The first grain cut by Bell's, was oats, a full crop, a good deal laid. In this the work was very well performed, and three-quarters of an acre cut down in a very short space of time. Afterwards it was sent to the barley, and four cuts having satisfied the judges, it was next sent to beans, of which it made excellent work, and we must say, better than anything on the field. In wheat it also did well; but the crop being very much laid indeed, the work was not nearly so well accomplished as in the case of the other kinds of grain. The great objection to this machine is its high price, £42, which is, we believe to be raised; and the great draught upon the horses. The pair we saw in the machine were fatigued to such an extent, that the perspiration was running off them as if they had been bathed. The horses were, however, shifted, and the work on the whole went on most satisfactorily. The breadth cut by this machine was six feet two inches.

2. M'Cormick's, improved by Lord Kinnaird. There was no apparent improvement upon this machine since last year. It performed its work very indifferently sometimes, and once or twice stuck altogether. Its peculiarity consists in the application of the endless web, of Bell's, to the principle of M'Cormick's. It has not hitherto made much progress among the agricultural community, although sometimes we have seen it work admirably.

3. Hussey's with Dray's improvement, attached by Gardner of Stirling, exhibited by Mr. Forrester of Stewarthall. This machine went through all its work very well indeed, especially the oats and wheat. It is destitute of the latest improvement by Dray; and we were rather surprised at its being preferred before Dray's own with the latest alterations, which are most certainly improvements. However, its work was fully equal to anything on the field, and it took the second prize.

4. Dray's Hussey with the latest improvements. The principle of these consists of a protecting shield of zinc to secure the stray stalks from getting entangled with the foot, and preventing the tilting-table from being wrought easily. The work which this machine made was very fair. It was, if anything, a little defective among the beans—cutting, we thought, through a mistake too high. In the wheat, which was very much laid indeed, and in fact altogether the worst crop we ever saw cut with machines, it did its duty well, and cut comparatively clean and smooth. This machine cut a breadth of five feet, and was much admired by the practical men present. A great many are in use among the agriculturists of this locality.

5. M'Cormick's original, exhibited by Mr. Alexander of Taylorton. This machine has been wrought by Mr. Alexander for a year or two, and has given great satisfaction. It performed its work in good style, only stopping once or twice to be put in order.

6. Dray's Hussey, exhibited by Mr. Maclaren of Craigton. This gentleman is the agent in this locality for Dray's machines; and the one he has had at work on his own farm was used by him on this occasion. Its work among the oats was admirable, while in the beans it did not cut so clean, but on the whole there was nothing to find fault with.

7. Dray's Hussey, exhibited by Mr. Mackie of Kersepatrick. There was no difference between this and the other machines manufactured by Mr. Dray.

8. Bell's, as exhibited by Mr. M'Queen of Arnheive. This machine wrought equally well with the rest, cutting the various crops with cleanness and efficiency.

It will be seen from the above report that all the machines were as near perfection as possible; and the judges must have had a very arduous task to accomplish in deciding between them.

The judges were Messrs. John Miller, C.E., of Millfield; John Gibson, Woolmet; Robert Walker, Portlethan; Peter M'Ewan, Blackdub; and James Stirling, C.E., Edinburgh. Their award was as follows:—"We, judges appointed to award the premiums offered by the Highland and Agricultural Society of Scotland, for the most approved reaping machine of the values undermentioned, and competed for this day on the farms of Stewarthall and Muirton, under the auspices of the Stirling General Agricultural Association, do hereby award the same as follows, viz., the premium of £20, for the best reaping machine of any price, to No. 1 of the Committee's list—Messrs. Wm. Crosskill and Sons, Beverley; and the premium of £20, for the best reaping machine not exceeding £25 in price, to No. 3 of the Committee's list—Mr. Wm. Forrester's Hussey, with Dray's improvement attached by Gardner, of Stirling. That while the judges were unanimous in the foregoing award, they think it right to express their satisfaction with the performance of the other machines on the ground, which was, on the whole, superior to that of former years."

This award will give, we believe, much satisfaction, as it

was the opinion of every practical man with whom we conversed, that these two made the best work on the field.

There was on the ground a very large number of spectators, including most of the leading agriculturists of Scotland, and a number from the sister countries. We observed the Duke of Montrose present, as also Sir Alex. Gibson Maitland, Mr. Blackburn, of Killearn, M.P.; Mr. Johnstone, of Alva, M.P.; Mr. Stirling, of Kippendavie; Mr. Campbell, of Boquhan, &c.

After the competition, a large number of gentlemen sat down to dinner in the Golden Lion Hotel; John Stirling, Esq., Kippendavie, occupied the chair, and James Johnston, Esq., of Alva, M.P., acted as croupier. Among those present we noticed the Provost, of Stirling; all the judges; Messrs. Dray, Crosskill, and Forrester, the makers or proprietors of the prize machines; Mr. Blackburn, of Killearn, &c., &c.

After the usual loyal toasts had been drunk, the Chairman gave "The Members of Parliament for the County and District," which was responded to by Mr. Blackburn, M.P. for Stirlingshire. "The Association" was then drunk, and Mr. Forrester returned thanks, hoping the society would not relax its efforts in the advancement of the interests of agriculture, but go on improving more and more year by year. He stated that he had been authorised by Mr. Dray to say, that if at next reaping-machine competition in Stirling ten of his machines started, he would himself offer a prize of one of his machines to the successful competitor. For a single individual this was more than the society had ever done, and he hoped it was an offer that would be taken advantage of.

Mr. BLACKBURN proposed "The Competitors," coupled with Mr. Crosskill, who returned thanks.

In reply to the toast of "The Judges," Mr. MILLER, of Millfield, said he hoped to see the attention of the Society next turned to the plough, and premiums offered for the best, as it was a subject of vital interest to the farmer. He thought reaping machines might profitably be allowed to rest for two years, and the attention of the Society turned to some other machine of use to the farmer.

Provost SAWERS proposed the "Highland and Agricultural Society of Scotland"; to which Mr. HALL MAXWELL, the Secretary, replied, and passed a high encomium on the enterprising character of the farmers of the locality and the good done by the Society. He called attention to the fact that there was no new machine on the field, at which he was much disappointed; and said that, as there had been on the field more than one of the same construction, it would be desirable to offer a prize to the ploughman working his machine best. For his part, he thought that the Highland Society would be glad to give a prize medal for this, as they did for ploughing matches.

Mr. WATSON, of Keillor, proposed "The Royal Agricultural Societies of England and Ireland"; to which

Mr. DRAY, the maker of the prize reaper, replied. He said —I regret exceedingly my inefficiency to return thanks as I ought for the honour you have paid me in coupling my name with these societies. I regret there are not other members present to witness the great progress made by your society, for I think the worst work of this year is better than the best last year. As an exhibitor, allow me to allude to a remark made by your excellent engineer, Mr. Miller, of Millfield, relative to waiting two or three years before any further trial of reaping machines should take place. If you do this, gentlemen, my opinion is you will go back. The machines are now in such a state that any farmer can take them with safety, and assist the makers in improving them in any little detail, now that the ground-work or foundation is laid. As an encouragement to them, I now find myself in the position of a good schoolmaster—namely, that one of my pupils beats me with my own machine. I will offer the price of one of my machines to ten competitors working, of course, machines of my make, and will leave it in the hands of the Highland and Agricultural Society of Scotland to give it as a prize for the tenant farmers alone; and I would advise the Society's prizes to be kept for makers alone. Allow me to thank you again, and I hope to meet you many years to come.

A number of other local and appropriate toasts were drunk, and the company separated at a very early hour.—Stirling Journal.

FLAX CROP IN IRELAND.

The return of the Irish flax crop for the present year, as prepared by order of Government, has just been completed, and shows a very considerable decrease in the breadth of land devoted to this important produce. The return is as follows:

Return in Statute Acres of the Extent of Flax in Ireland in 1855, compiled by desire of his Excellency the Lord Lieutenant, in anticipation of the General Tillage Return:

Counties.	1854.	1855.	Decrease.
	Acres.	Acres.	Acres.
Antrim	8924	6740	2184
Armagh	16295	9446	6849
Carlow	32	81	—
Cavan	8842	6021	2821
Clare	909	902	7
Cork, F. R.	2595	1982	613
Cork, W. R.	729	422	307
Donegal	26061	15780	10281
Down	19895	11131	8764
Dublin	5	—	5
Fermanagh	3480	2007	1473
Galway	785	544	241
Kerry	673	651	22
Kildare	6	8	—
Kilkenny	54	44	10
King's	214	259	—
Leitrim	1022	718	304
Limerick	316	244	72
Londonderry	17230	11760	5470
Longford	592	264	328
Louth	694	191	503
Mayo	999	701	298
Meath	481	253	228
Monaghan	16222	11809	4403
Queen's	11	7	4
Roscommon	430	382	48
Sligo	493	377	116
Tipperary, N. R.	108	61	47
Tipperary, S. R.	91	42	49
Tyrone	22453	13288	9165
Waterford	31	43	—
Westmeath	260	201	59
Wexford	466	822	—
Wicklow	5	1	4

Total in Statute Acres: In 1854, 151,403; in 1855, 97,192.
Total Decrease in Statute Acres, 54,211.

The increase is—in Carlow, 49 acres; in Kildare, 2 acres; King's County, 45 acres; Waterford, 12 acres; Wexford, 356 acres. Total, 464 acres.

The agricultural returns of 1855 have not yet been received from Ballymena, Newtownards and Ballynahinch, Tralee and Killarney, Coleraine, Ballina, Newport Pratt, and Belmullet. The extent of flax for this year has been taken from the returns of 1854, a reduction having been made proportionate to that which is found to have taken place in the other districts of the county.

Note.—The foregoing table has been compiled from special returns collected by the efficient aid of the constabulary, and

it is apprehended that, on the further revision of the Agricultural Returns of 1855, no difference of any great importance will be found between the extent of land under flax given above, and that which will appear in the General Abstract, now in course of compilation.

WILLIAM DONNELLY, Registrar-General.

Total extent of flax grown in Ireland in the following years:—1850, 91,040 acres; 1851, 140,536 acres; 1852, 137,008 acres; 1853, 174,579 acres; 1854, 151,403 acres; 1855, 97,192 acres.

We learn from other sources that the crop has been nearly all pulled, and that in point of bulk it appears a good average one. The samples of new flax brought into market are also of an excellent quality, and better than last year's; but it is yet too soon to form a correct opinion of the quality and produce of the crop in general.

THE WAR AND ITS INFLUENCES.

War has ever had its calamities, and the struggle in which we are now engaged with Russia is proving itself no exception from the common rule. But while the deadly strife in which we are thus engaged brings mournful tidings to almost every door, let us not forget that even war itself has its blessings as well as its curse, for the blood that England is now shedding along with her Allies may justly be said to be the first instalment paid for the civil and religious freedom of the continent of Europe. In vain, for example, have the arbitrary governments of the north conspired together to check the progress of things, for the very means they have used to subjugate Christendom to their yoke are now being turned against themselves, and all the deep-laid schemes of half a century suddenly brought to nought by an overruling hand. For upwards of this length of time has Russia been planning the downfall of Turkey, the erection of a monster Greek church at Jerusalem with univeral sway, having the Czar of Petersburgh as its "Emperor God," and the construction of political machinery for the government of the world as the Russian empire is now being governed! During this long period the unfortunate slaves of her vast dominions have been toiling night and day in making fortifications in number and magnitude such as the world never saw. By a system of diplomacy, again as disastrous to the peace of Europe and Asia as it has been apparently successful to her own ends, she has sown insurrection in almost every state, in order that she, or others acting in concert with her, might have the opportunity of restoring peace, and thus bringing those kingdoms under her subserviency. In this manner almost all Germany lies prostrate at her feet, with Persia and the Christian population of Turkey, amounting to half the subjects of that empire! But now that the prophetic year (1855) has arrived for the consummation of the hopes of "holy Russia," what is the result? *A prostrate world at her feet?* No! but the very reverse; for her fortifications are fast disappearing from the face of the earth, and the military system in which she trusted is found of no avail in the hour of need; while those arbitrary governments which have allowed themselves thus to become subservient to her purposes find that they are even now in a worse position than she herself. In short, the more any government or statesman favours Russia, the more certain is her disappointment, and the more successful and speedy the introduction of a new and happier state of things.

A glance at our imports proves this. How fast, for example, is the blank made by the blockade of the Russian coasts being filled up by other friendly states! so that, in a few years, we shall be better supplied with corn and other products than previous to the war. Throughout Europe and Asia, again, the political view of things is equally favourable; for the Spanish Peninsula and Italian States are now learning a practical lesson; while our German and Turkish legions are but political missionaries which Russia has called into existence for the dissemination of progress at the termination of the war, and even during its currency. Vexatious as the thought of calling into existence political elements of such a dangerous character may be felt after all the care taken to suppress them, yet the idea will not be found more unwelcome to the arbitrary governments of the North of Europe, than will the great reality itself, nor one whit more certain. Much as has been said about our "military dotage," "Balaklava blunders," "Vienna break-downs," and the like, on the one hand, and the apparent good luck of Russia, Austria, and Prussia, on the other, we question very much if a different fortune of the war would have been productive of such promising results; for our military misfortunes have proved in the most satisfactory manner that the dregs of arbitrary times must even be wiped away from the institutions of England herself, and not adopted as an example by other reformations! The subject is thus a comprehensive one, whether we view it in a commercial or political light.

Even England herself, with her colonies, is learning a timely lesson from the war. Every day added to the period of its duration is adding fresh testimony to the truth of this; for, at the commencement, Sebastopol was to be taken, and peace restored to Turkey, without delay. But such is not what hung suspended in the scale of Providence. As it is with individuals, so is it with nations—"Whom the Lord loveth, he chasteneth;" but no chastisement would have been realized in this, not even by Russia herself, owing to her close-door system. Hence the only alternative: the rod of war must be felt at the very centre of the hitherto-impenetrable dominions of that Empire, until the chains of civil and religious slavery fall from every Muscovite serf. The Christian population of Turkey must be taught to distinguish between priestcraft and religion; intellectual freedom must be established in Germany and Western Europe; and England herself aroused from a state of supineness altogether incompatible with the position she has been called upon to

occupy among the nations of the world, at the present interesting period of its history.

Civilly speaking, we are not here addressing ourselves to military affairs, but to the progress of foreign and colonial agriculture, and the commerce of its produce. We are now annually dependent upon a large supply of foreign corn, for example; and sound policy demands that we adopt the necessary means for obtaining a regular supply, on the most advantageous terms. Now, during the forty years' peace prior to the present war, what was the policy we pursued in this respect? Why, simply this: we cultivated a dependence upon Russia, and by so doing enabled her to fortify the shores of the Baltic and Black seas, and at the end of that period to set our army and navy at defiance; and not only so, but to prohibit the export of corn from her seaboard, thus doubling our war expenditure, while it reduced hers, and starving us, as it were, into compliance with the Vienna conditions of peace—a very sagacious reserve on the part of the Muscovite Emperor, one which, but for the interposition of Providence, and the more than bountiful harvest which we last year reaped, might have proved no easy foe to conquer. Napoleon I.—no mean authority—foretold in the plainest terms the force of Russian aggression and diplomacy as now realized. Every crowned head in Europe was impressed with a similar conviction at the time; and every subject in Christendom has seen, during this period, that Russia would embroil herself with England in the present struggle. Now, such being the premises, what steps did we take to provide corn for our millions during the war? The question is easily answered; for towards the close of the second campaign, how many of us are there who are still clinging to an inglorious peace and the immediate supply of serf-grown corn from Poland and the Ukraine! In short, how many are there who still look for the restoration of things just as they were, without any progress whatever either in agriculture or commerce!

An inglorious peace is, no doubt, within the range of diplomatic possibilities, and also the restoration of things to the position they occupied before the war; but granting that such were realized to-morrow, what would be their stability or period of duration, and the consequent supply of corn we should receive from Russia? An inglorious peace is, indeed, but too possible, so to speak; for if we have only two alternative systems of government before us—the universal sway of Russia, and Republicanism, as prophesied by Napoleon I., already noticed—then it is more than probable that three-fourths of the governments of Europe would prefer the former to the latter as the least of two evils. And it is perfectly possible that their diplomatic blunders may prove the "stepping-stones" to the final settlement of the Eastern question; for under such circumstances the Greek church—given over to "strong delusion" to "believe a lie"—may yet make a final effort to rear the standard of universal sway at Jerusalem. This has long been a cherished belief among Moslems—hence one of the reasons why Turkey will not allow her Christian subjects to carry arms; but whether successful over Islamism or not, such an effort will most assuredly fail, proving itself the prelude to a new state of things throughout the whole of Christendom. The three great temporal systems of Islamism, Romanism, and Grecianism, have nearly finished their earthly career. Beyond their time neither England nor her allies can uphold them; and, therefore, during the political commotions which must be experienced during the wide-spread change here involved, it would be wise on their part to look to other sources of supply for corn than Russia.

The more intelligent and thinking portion of the English people do so already—looking to our immense colonies and East Indian territories for our principal supply of bread-corn. The war is beginning to show to them that, before a final settlement of the Eastern question can be obtained, the serfs of Russia and the enslaved rayas of Turkey must be liberated from their present state of bondage, and elevated to independent members of society; in short, that high wages and prices of produce must become the rule in Russia as in England and her colonies.

Under this view of the subject, we may observe that our transatlantic cousins of the New World have learned a lesson from the war, as well as the mother-country. A very cursory glance at the facts of the case will prove this. At first, for example, they were impressed with the notion of peace and the immediate re-establishment of things as they existed before the war, and consequently made no effort to extend their corn trade connection with the mother-country on a permanent footing. What they had they gave us willingly, but had no idea of appealing to the forest for an increasing supply, so as to pocket some 20,000,000 dollars extra annually, which lately went into the pocket of Russia; but they now see that the Greek merchants of Russia can no longer appear as their competitors in Mark Lane on the old terms, at least for any length of time. Before England can trust to them for a regular supply of corn, the Russian empire must be broken to pieces, the map of Europe remodelled, and the subjects of Christendom generally placed in the full enjoyment of their Christian privileges. The fruitless issue of the first campaign and the wintering of the allied armies in the Crimea removed the screen which had previously hid these things from view; proving that, however governments may dally in their diplomatic relations with one another, they cannot check the progress of science among the masses of their subjects, much less divest the Omnipotent Ruler of all things of the prerogative he exercises in the government of sublunary affairs—disposing of kings who betray the trust placed in their hands, with the same ease as the most helpless subjects of their realms.

The grand question at issue, as already stated, is to obtain a regular supply of bread-corn from states with which we have no chance of being at war—such as our own colonies, now free, separate, and independent states; our East Indian territories; the United States of America; in fact, all the world, Russia, Austria, and Prussia excepted. We are not therefore limited to a

narrow field with which to form a permanent corn-trade connection far more promising to the regular trader and the general prosperity of the home-market than any connection we can reasonably hope to re-establish with the Muscovite empire, which, so long as it has a being, must continue to grasp at the universal dominion of the world. So long, we repeat, as this is the religious ambition of the Greek church, just so long will it be imprudent for England to trust to her, or any part thereof, for a regular supply of bread-corn. Before we can do so, the sword with which she proposes evangelizing the world—converting all nations to her creed—must be wrung from her grasp, and turned into a "ploughshare," and the lance of her barbarous Cossack into a "pruning hook." It is otherwise with our colonies, Indian empire, United States of America, and other governments with which we are in friendly relation, such as the Spanish Peninsula and Italian states, now shaking off the yoke of Romanism, and joining us, heart and hand, in the march of progress. In this there is far more than an alliance of merely martial means to repress the sword of Muscovite aggression or the temporalising aggrandizement of any religious sect; for at the Exhibition at Paris the Arabian princes, on seeing the success of our agricultural implements and machinery fairly tested in the field, at once declared their determination to have them introduced into Algiers! "One fact," it is said, "is worth a thousand speculations;" and here is a fact which one day may exercise a greater influence upon the corn trade of France and England than some of our readers may at first-sight imagine; for Rome, when in her glory, received from the opposite shores of the Mediterranean no small amount of her bread-corn; and were all our chemical and mechanical means, including our liquid-manure systems, &c., &c., brought to bear upon the African soil, it would be difficult to say what might be the increase of corn supplies from that quarter of the globe alone. Since the commencement of the war, again, double attention has been turned to the corn-trade benefits resulting from the opening-up of our immense colonies and East Indian empire by railways, and the bringing of our improved agricultural machinery and implements to bear upon their soils. When we think of the rudeness of the Hindoostanee machinery exhibited in Hyde-park in 1851, it is altogether impossible within our present limits to contemplate what might be the increase of our Indian territorial produce were our improved chemical and mechanical appliances introduced there. In a separate article we shall endeavour to survey the magnitude and importance of this field to England, meantime only turning our readers' attention to it.

From these hurried observations it will thus be seen that no kingdom in the world has an equal opportunity with England of deriving from within her own dominions, home and colonial, a proper supply of corn, if the necessary steps are taken to procure it; and, therefore, that the war with Russia ought not to have deranged the balance of our corn-trade—that this derangement can only be accounted for by the short-sighted and selfish policy of forming a corn-trade connexion with an Empire which grasped at our own subjugation to her yoke, with the downfall of our allies and East Indian Empire; that until Poland, the Ukraine, Bessarabia, and the Danubian Principalities are formed into free, separate, and independent states, beyond the temporalising influence of the Greek church, we cannot reasonably hope to receive from them a regular supply of corn; that the losses which the Greek merchants themselves have sustained in the Black Sea and Sea of Azoff, on the present occasion, ought to teach them that transactions in corn, or, in fact, anything else, between Russia and England, is a dangerous speculation, not to be embarked in without impunity until the Eastern question is finally settled, which can never take place so long as the Greek and Roman Churches lay claim to Jerusalem as the seat of an Universal Government, which England, and more than England, will never tolerate; and, therefore, it becomes England herself, under such a complicated and unsettled state of things, to look to friendly states and her colonies for her annual supply of corn; for in doing so she only discharges a duty she owes to them as well as to herself.

BROOD MARES.

BY CECIL.

An attempt to lay down infallible rules upon which to determine what mares are eligible for the production of racing stock would be met by practical examples calculated to overturn such a theory. There are instances of the most unpromising giving birth to extraordinary foals, and there are as many instances of the most promising never having bred one worth the expense of rearing. This, however, does not apply to the advantages which breeders of thorough-bred stock possess of making judicious crosses, having to direct them precedents of constant occurrence. One of the most important considerations is, to select good blood—blood distinguished either for speed or stoutness, for I believe there is scarcely an example of a mare having bred a good foal, unless her ancestors were gifted with one of those faculties; and, although she may not have evinced any excellence on the turf herself, it is not improbable she may breed a foal which will not disappoint the owner. Those who confine their attention to breeding solely for racing regard shape and make with indifference, but it is a subject which demands considerable attention. Action depends on the symmetrical adaptation of parts, and, unless it be naturally harmonious, great superiority cannot exist. Imperfections in the fore legs are very commonly overlooked, and it must be admitted that some of the offspring of families notorious for this fault have been endowed with extraordinary racing qualifications; yet it is very doubtful whether, in the long run, and under all circumstances, it has proved profitable to breed them. If one turns out well, how many are there which entail great losses? Hereditary infirmities, among which roaring stands pre-eminent, should be avoided with the most unflinching determination. The impetus given to breeding horses of other

classes, arising from the very general demand for them, both at home and abroad, instigates many persons to invest their capital in the speculation. It may be said the first important consideration is a judicious choice of the mare, and the next of the stallion which is to become her partner; but there are several little items worthy of notice before it can be determined what sort of a mare will best answer the purpose of the speculator. It is utterly useless to attempt the breeding of hunters, or horses which are expected to realise high prices, without suitable buildings for their accommodation, and a site either naturally dry, or which has been rendered so by the artificial process of draining. Furthermore, it is not prudent to commence such an engagement without an ample capital, and spirit to turn it to advantageous profit. Failing in these essentials, it is better to confine ambition within more humble circles. There are many circumstances under which a more common description of horses may be bred with advantage, but, unfortunately, persons who breed them are discontented because they cannot realise the profits which are attainable for animals of superior pretensions; they do not take into consideration that they have not expended the capital or exercised the judgment of their more enterprising and successful neighbours. It must not by this remark be inferred that I would recommend breeding inferior animals, but I would never recommend any person to enter into the speculation of breeding the highest class of hunters, and riding horses, unless he will embark in it with energy and liberality. Carriage horses require nearly as much outlay in their rearing as hunters; and when they are handsome, with superior action, they produce remunerative prices. Light active cart horses may pay their way, but in the choice of them, unwieldy size should give way to the greater recommendation of form and activity.

One of the impediments to breeding hunters arises from the fact that a great many mares are used in the hunting field. In former days, it was not the fashion to ride mares; but when it was discovered that they were quite equal—in many cases superior—to geldings, in stoutness and usefulness, the prejudice subsided. It is not, therefore, an easy matter to procure a good mare for breeding hunters, till she has arrived at an age when she is scarcely adapted for the stud. In breeding race horses it has often proved the case that their best foals have not been produced till one of the parents was stricken in years, though this applies more generally to stallions than mares. This, however, does not furnish an analogy in breeding hunters. It cannot be expected that an old mare at the age of fifteen or sixteen years, having been through many severe chases with hounds, if put to the stud will bring forth fine vigorous foals; but when such animals can be obtained at nine or ten years old there is great probability of success. A good sound young mare may be expected to produce ten or a dozen promising foals, and it is a far better speculation to commence with such an animal, at a fair price, than with an infirm worn-out creature, whose produce will seldom defray the expenses of rearing. It is from such mistaken conceptions as these, that many persons, from disappointment, have given up the speculation of breeding as an unprofitable investment.

One of the great errors of recent days, in the choice of horses, has been the great predilection for length. It is, no doubt, of importance in a race horse, and likewise in a steeplechase horse. It is a different case with a hunter. Great length is conducive to speed, but not to activity; a leggy hunter, with an immense stride, can go for ten or fifteen minutes over large grass fields, when the country is not too deep for him; but the short-legged quick animal will beat him over the plough, and where the fences are numerous. When steeple-chasing first came into fashion, it was regarded in good favour as an inducement to breed horses which would be calculated to make hunters. It has failed to do so, from one of the causes already named; indeed, it has a prejudicial effect, inasmuch that it has been the means of encouraging a description of horse calculated for that purpose alone, and it has inculcated a taste for horses of those proportions; a taste, however, which is daily increasing in favour.

There is no style of horse more improved than the carriage horse. This, it must be acknowledged, is due to the alterations which have been introduced in the construction of carriages. When the old-fashioned family coach was in vogue, it was necessary to have gigantic animals to draw it. Their pace scarcely exceeded six miles an hour. That cumbrous vehicle is put out of countenance by one of a lighter and more elegant construction; consequently the horses are of a totally different character, able to trot ten miles an hour with perfect ease. If a pair of the ancient worthies which had undergone the barbarous operation of having their tails nicked and their ears cropped, had been put to a vehicle of the lightest construction, they could not have improved their pace; while many of those which are used in carriages at the present period are quite speedy enough for hunters.

The great demand existing for horses presents another obstacle to breeding. There are so many mares at work. The deficiency is more apparent in mares than stallions. A horse may be the progenitor of seventy or eighty foals in the year, but a mare produces but one—not even that, because reckoning contingencies, on the average, the produce barely exceeds two in three years. It is a question worthy of consideration whether foreign mares might not be imported with advantage; but the suggestion is offered without any practical experience to recommend it. They certainly would not be available for any other purpose than for harness work or for the cavalry. With respect to the latter, experience and necessity will, probably, operate in the selection of animals better adapted for the purpose than the majority of those which have recently been introduced into the ranks. When only required for parade in the time of peace, a tall blood-looking horse looks grander and more majestic than a thick-set short-legged animal, with less breeding; but for active service a different style of animal is obviously necessary. Many of this kind, which have been rejected, must inevitably come into requisition. The soldier does not require a horse of great speed, but one which is capable of carrying weight, and active on his legs. There is still a distinction to be made between the horse adapted for this purpose and the mongrel nearly related to the cart horse. Such animals do not possess activity, and it is quite a mistaken notion to assume that they are gifted with good constitutions. There is no class of the equine tribe more susceptible of indisposition than the cart horse. Go into a farmer's stable, where there are six or eight of these animals, and you will find several of them afflicted with some disorder. Bad coughs, swelled legs, the consequence of hereditary grease, bog spavins, thorough pins, blindness, frequent attacks of colic, and other complaints very constantly prevail. These disorders are not very great impediments to the work they are required to perform, and are consequently unheeded; but if they were put to more arduous occupations they would soon be worn out. A walk, and that a very slow one, is the only pace they can accomplish; therefore, they are useless for any other purpose; and there is no class of this species in which improvement is so requisite by the introduction of more active animals than the common cart horse.—Sunday Times.

THE ADVANTAGES OF DEEP TILLAGE.

At the meeting of the Cirencester Agricultural Society Mr. LAWRENCE said: The more experienced agriculturists will excuse my enforcing truths with which they are familiar, my object being, not to offer a mere individual opinion, but to explain to our younger brethren the reasons and grounds on which I practise, and strongly advocate, deep tillage. I select this subject because I well remember a farmer having in this room, at a previous meeting, advocated shallow tillage; a man of considerable experience too, whose opinion was likely to receive much attention. I am quite alive to the folly of attempting to lay down any system of tillage as of universal application; there will be exceptional cases. There are, however, certain principles with which we should be familiar before we can safely determine our practice in particular cases. The first question would seem to be, what are essential agents to vegetable life and nutrition? The second, by what means is the action of those most effectually and economically secured? The successful growth of all our crops is dependent on the due supply of each of two classes of elements; the one distinguished as organic, the other as inorganic. My young friends who may not be familiar with these terms will bear in mind this very simple distinction of these classes: Organic matter consists of those parts of the animal and vegetable kingdom which are entirely destructible by fire; whereas inorganic matter, on the other hand, consists of those parts which are indestructible by fire, such, for example, as the ash left after the combustion of animal and vegetable substances and all minerals. Professor Liebig at one time taught that inorganic or mineral matter alone was essential to vegetable growth, and that organic matters were non-essential. In other words, that with organic matter alone we could raise our crops, and in the absence of it we could not. That a combination of both organic and inorganic elements is essential to the greatest production has, however, been well established. Ammonia and carbon exemplify organic, and the phosphates and alkalies exemplify the inorganic elements. Ammonia is believed to be derived by plants chiefly from the atmosphere, but in part from the decomposition of animal substances by the free admission of air. Carbon or charcoal, for that is nearly pure carbon, is an essential element in the growth of plants. In its natural state, as charcoal for instance, nothing acts upon it, neither water nor air; it is quite inert for any purposes of vegetation. When heated, either by fire or by the slower process of decomposition of animal and vegetable matter in the soil, its affinity for oxygen is much increased, and the result of its combustion is the formation of carbonic acid gas. That gas is decomposed by the agency of plants, and thus they obtain their carbon. Now, the free access of air is absolutely essential to this process. Having specified some of the more important agents essential to vegetable growth, we will now consider the second question—by what means the action of those agents is most effectually and economically secured? You must divest your minds for our present purpose of the popular notion that earth, strictly speaking, is the source of vegetable nutrition; for the earth, apart from the elements we have been considering, is an inert mass, into which the roots of vegetables spread themselves in search of their respective foods; the means by which they are retained in their after-growth in an erect position, spreading out their foliage to those atmospheric influences on which their successful maturity greatly depends. Plants draw from the soil such nourishment as they derive from that source by the minute mouths at the end of their delicate roots, and by means of the absorbent vessels contained in their leaves. You will readily understand, therefore, that such minute organs cannot take up anything in a solid state. They can only absorb nourishment in the state of fluid or gas. If the soil were deprived of the access of water and air, it would be utterly unproductive, though full of the sources of nutrition. Our time does not admit of any minute description of the mode in which these elements are severally rendered available to plants—it is sufficient for our present purpose to know that the soil is the medium of communication, and therefore it is essential that every portion of it into which the roots extend should be rendered easily accessible to the natural solvents, air and water. The moisture in the atmosphere absorbs the ammonia floating in it, and rain brings this down to the earth. Water and air accelerate decomposition both of the animal and vegetable substances applied to the soil; this decomposition produces a further supply of ammonia, carbonic acid gas, and warmth. Carbonic acid, produced as we have before seen, with the aid of water, renders soluble many inorganic or mineral elements also, which by that agency alone are assimilated by plants. Some portion of these mineral elements are being continually absorbed, and carried off our land in the shape of corn, beef, mutton, &c. The subsoil is in most cases the almost inexhaustible bank of deposit of this mineral matter, on which we can most readily and successfully draw; it is by loosening this, and exposing every particle of it to the action of the atmosphere, that the requisite supply of mineral matter is rendered gradually available. It is simply on this principle that fallowing depends. When land has been to a certain extent exhausted of its available mineral elements required by a crop of wheat, by free exposure to the atmosphere for a time, a further supply is rendered soluble, and available for the succeeding crop. The popular notion is, that fallowing is resorted to merely for the purpose of destroying couch and other weeds — a very useful accident of fallowing; but the other is the more important result. Deep tillage, then, is the means by which the air is freely admitted to the subsoil, where it promotes the decomposition of organic matters and the production and absorption of ammonia, and with the aid of water it also renders soluble the mineral matters contained in it for the use of future crops. A further result is, an increased temperature of the subsoil, by the free admission of air and water, which you all know greatly promotes vegetation. Our forefathers were at some pains to facilitate the escape of rain from the surface of the soil, which science teaches us to welcome as a very important fertilizer, and to afford a free passage through it. Mons. Barral, a French chemist, has demonstrated by experiments, that where about 25 inches of rain fall in the course of a year (which is under the average of this district), that which falls on an acre of land contains, and conveys to the soil, fertilizing matter equivalent to the quantity of ammonia contained in two cwt. of Peruvian guano, with the addition of 150 lbs. of nitrogenous matter of a highly fertilizing character; nearly all of which the late experiments of Professor Way prove is absorbed in the passage of the rain through an adequate depth of soil. The experiments of Mons. Barral have been repeated, and

the results have been confirmed by Dumas, Boussingault, and other well-known chemists. The same influences which have rendered our surface soil productive, will produce the same effect on our subsoils, if freely admitted. Subsoils of land and some gravels are exceptional cases; but in nearly all clays, and in all subsoils of an aluminous or tenacious character, and into which we know the roots of our crops will extend themselves in search of food, common sense would seem to point out the advantage of adopting those means by which that food can be most readily supplied. I am no advocate for radical reform, and turning matters upside down, and bringing the subsoil to the surface, but merely that it should be loosened by the common subsoil plough, and rendered accessible to atmospheric influences, and thus gradually prepared for vegetable nutrition. When so prepared, the ordinary plough may be set from time to time a little deeper, and the subsoil be thus gradually incorporated with the surface soil. There is hardly a parish in the kingdom in which a practical demonstration cannot be found of the advantage of deep tillage, and in which land become comparatively unproductive after long shallow ploughing, and has not become productive enough under the fork and the spade of the gardening labourer who has no other aid to give it. I wish to be clearly understood as not recommending deep ploughing on all occasions; for instance, not clover ley for the wheat crop, nor to fallow the sheep fold by a deep furrow for the barley crop, &c.; but that, in the course of the shift, whether the 3, 4, or 5 years' course, deep tillage for the root crop should be the rule, with very few exceptions.

FARMING REQUIREMENTS OF THE AGE.

At the Tyneside Agricultural Society's show held at Hexham on Tuesday the 28th Aug., in returning thanks for his health being given, Mr. John Grey, having confessed his gratification at the manner in which his name had been introduced and received, and gracefully repudiated some considerable portion of the compliments paid to him as the upholder of the society—an ascription which, if ever true, was true no longer, the society being now able to go alone, in full independence of the support of any one individual member—he proceeded to state the two great requirements made of the farmer by the wants of the age: 1. To increase the produce of his land. 2. To diminish the expenditure by which that produce is obtained. Owing (he said) to emigration, to the distressing war in which we were engaged, and to other circumstances, there had been a falling off in the supply of labourers—a destitution in the labour market; and if more produce was to be extorted from the soil, it must be by liberality and judgment in its cultivation, and by (what it was the main object of this society's exhibitions to promote) the introduction of the most productive and profitable stock. To agricultural societies, like the Tyneside, much gratitude was due for the stimulus which they had given to increased production; and they must all rejoice that the recent meeting of the Royal Society in Carlisle, alluded to by the Chairman, had proved, in all respects but the weather, a most successful one. Many important machines had been exhibited and tried. The reaping machine, now so much a desideratum, had not, so far, been productive of any great effects in agriculture. Many failures and disappointments had marked the persevering efforts to bring it into use. In the present harvest, however, such had been the weather for some time past, that farmers were not in a condition to use any other machine than the old-fashioned one of the sickle—not even the scythe. But if, at Carlisle, no decided step had been gained as to the reaper, other machines had been tried successfully and conclusively. The Chairman had referred to the thrashing machine; and truly it was surprising, as Mr. Errington had remarked, to see farmers—large farmers—straining and wearing the sinews of their horses, when a little fuel and a little steam would do the work so much more effectually and economically (Hear, hear). In this respect, however, progress was being made, for farmers were mending their ways; and it was important to know one economical result of a competition between two thrashing machines at Carlisle—namely, that the one consumed one-third less fuel than the other in doing the same amount of work. The more such machines were used, the more they would be improved. Then, again, there was the plough. It was found that a plough made by that eminent manufacturer, Ransome, did its work with one-third less power than another, whose work was done about as well. Was not that an important fact? If two ploughs of one kind could do the work of three of another, every farmer must see the extraordinary saving which accompanied the use of the superior implement; or if one plough could turn up a furrow of 9 inches, and the other a furrow of only 6, was not the former a great desideratum as compared with the other? The importance of a deep cultivation of the soil had often been impressed on the agricultural mind; and in seeking a deep foundation for their manures, the most economical means should be used. If, to vary the illustration, two acres could be made, without additional cost, to bear the produce of three, was not that preferable to the cultivation of three acres, and the attainment of the produce only of the two? Many desirable things had been brought under notice at Carlisle; and one thing, which was very desirable, was the collection of the best possible information as to the science and practice of agriculture. When, however, prophets came from a distance to lecture the farmers of any district on their usages, they should be sure that they knew what they were talking about. The farmers of the North had been called to account for their deficiency in hay-making. They were told that their hay should have been in stack three days after it was cut, and that the antiquated practice of putting hay in pikes should be discarded. He should like teachers of agriculture to come to the North, and serve an apprenticeship in our climate, before they again gave lectures on hay-making. They would soon find their fallacies overthrown by the seasons. Mr. Mechi lived in a dry climate. His farm was not watered by one-half

—probably not one-third—the rain which fell in the North of England. Were he to make hay in the North as he made it in the South, he would find himself in possession of a mass of rottenness (Hear, hear). Mr. Mechi farmed a poor soil, which, generously dealt with, yielded large crops. The same system, if followed here, as Mr. M. recommended, would prove ruinous. He (Mr. Grey) farmed a little himself, and he had tried various experiments. He had applied artificial manures in the manner advised. And what was the result? Heavy rains had fallen, and his manures were washed away and lost. The produce was inferior to that of his lighter crops. He was not one who advised the farmer to be niggardly in his management, but only to be judicious as well as liberal. Those gentlemen who came into the North—in a spirit that could not be too highly commended—to instruct the farmers of the district in agriculture, should be told that their system, however good and profitable in Surrey or Cambridge, or even on the Wolds of Yorkshire, were not applicable to this more northern part of England, or to Tweedside. Were they to do in the North as they did in the South, they would run great risk of over-doing it, and of inflicting injury on themselves (Hear, hear). Mr. Grey made some concluding remarks, and resumed his seat amidst cheers.

THE AGRICULTURE OF SPAIN.

The progress of general knowledge, and its beneficial operation upon agriculture, is perhaps nowhere more exemplified than in the Spanish Peninsula. At the commencement of the present century that important country was chiefly remarkable, in an agricultural point of view, for its immense flocks of migratory sheep, and the fineness of the wool they produced. We looked to that fine kingdom for scarcely anything besides. In the last few years, however, another article of commerce—wheat—has been extending there, and imported into this country, of a very superior quality and increasing abundance. To this result several great causes have contributed. The progress of liberal ideas in Spain has been considerable; general knowledge has also materially increased; the lands which have been locked up in the hands of the convents and monasteries have been sold; roads, railways, and canals for irrigation have been constructed; and the result has been, that the richest portion of Spain—that of the centre provinces, where the soil is the best, and the population the least—has been enabled to profitably produce and send her corn to the sea-coast.

From these circumstances, we find that whilst the imports of Spanish wool into this country have been steadily decreasing, that of wheat has been rapidly enlarging. Of Spanish wool we received in 1850, 440,751 lbs.; this decreased in 1854 to 383,150 lbs., to 233,413 lbs. in 1852, and to 154,146 lbs. in 1853. In these years, however, the amounts of the Spanish wheat and flour imported observed a very different direction. It was:—

In 1850	2,184 qrs.
„ 1851	115 „
„ 1852	6,321 „
„ 1853	103,614 „

and this has since gone on very largely increasing in 1854 and 1855.

Spain has been but little examined by the English farmer. The report of Captain Widdrington, in the fourth volume of the Journal of the Royal Agricultural Society, is still the most graphic in our possession; and from it we think the reader may safely conclude that Spain will, in all probability, become a much more considerable corn-exporting country than at present. It certainly possesses the great primary requisites—viz., a suitable soil, a fine climate, a thin population, an almost total absence of great, and consequently largely consuming, towns. The agricultural districts of Spain have been divided by Capt. Widdrington into three great zones, almost naturally marked out by their climate—the first, or the most southerly, and the warmest, forming the dry and warm shores of the Mediterranean, whose magnificence is still traditionally remembered by the Moors. "This division," says the Captain, "is that of the territory lying along the Mediterranean at the foot of the Sierra Nevada, and the great secondary ranges of mountains which extend with hardly any interruption from the western extremity of the Peninsula to the Pyrenees. In the whole of this comparatively narrow district, to which I have applied the name of 'tierra caliente' (warm land), little wheat, or even barley, is cultivated. The soil in most of the finest and most highly cultivated parts—as the Huertas or gardens of Valencia and Murcia—is naturally poor and arid, and owes its exuberant fertility to the hand of man, by irrigation; of which, amongst the finest, if not the very finest, works in the world, are those of the Moors, which still remain unaltered in the hands of their descendants." It is in this division that wheat harvest takes place at the end of May, where, open to the warm breezes of the Mediterranean, the vine, rice, sugar, or even coffee, is successfully cultivated.

"The second region is by far the greatest in extent, in value, and importance in every way, of the Spanish Peninsula. It comprises the two Castiles,

Aragon, Estremadura, the greater part of Catalonia, Upper Andalusia, and part of Navarre and Leon. From the products of the greater part of it, the term 'cerealian' may be applied with great propriety. Throughout its vast extent wheat is produced in quality, and would be in quantity if it were properly tilled, equal, if not superior, to that of any country on the globe. The better parts of this division are the two table-lands of Old and New Castile, the territory of Guadalaxara, the Alcarria, a district near the sources of the Tagus, that of the valley of the same river above and below Talavera, the province of Toledo. In Old Castile the territory of Olmedo and Palencia, and most parts of the course of the Duero and its tributaries." This is a fine, dry district; where the annual rain fall in some portions, as those around Madrid, is not more than 10 inches. It is here, too, that the great native phosphate of lime beds are found, near Logrosan, which Dr. Daubeny and the captain explored. The corn in this land is produced readily enough; but hitherto it might rot where it grew. The farmer was placed in provinces utterly devoid of roads to a shipping port: he looked in vain for a navigable river. Even the navigation of the great Spanish river Tagus is barred by a ridge of rocks; and if these were removed, its mouth, like that of the Douro, is in a foreign country.

It is in the third, or humid, division of Spain that cattle are chiefly reared, and butter produced. This includes the provinces of Gallicia, Biscay, and the Asturias—countries open to the moist breezes of the Atlantic. Hence come to us, from their many ports, those Gallician cattle, with their huge, wide-spreading horns, which, on their first arrival at Southampton, so much amazed our Hampshire readers. Here little wheat is grown; and, in consequence of the want of communication, the grain, which is often unsaleable in Old Castile, bears a very high price in Asturias, not many leagues distant.

It is very desirable that the English farmer, who has to contend by the aid of skill and his own indomitable Saxon perseverance against obstacles which in Spain nature removes unasked, should be aware of the gradual changes which are going on in that kingdom—in a land some of whose soils are described as of such surprising fertility, that, with a little manure, they bear successive crops of the finest wheat, yielding twenty-five, thirty, and even fifty-fold return, for thirty or forty years in almost unbroken succession. From such a glance, he may derive not only a timely warning to continue his exertions, but an assurance that if ever his own noble efforts to supply food fail to keep pace with a population increasing at an accelerated pace, there are other rich but only partially cultivated lands, which, instructed by his example, will continue the supply when his granaries are exhausted.

HARVESTS AND PRICES IN RUSSIA.

In case of a failure of the harvest, every proprietor is obliged to feed his own peasants; and to provide against that emergency, there are established in every village what are called provident magazines of corn, in which there is obliged to be kept a certain quantity of rye and barley—(I think it is three quarters for every soul; but as only the males are taken in the census, of course it will only give half that quantity per head). As it rarely happens that the harvest is a complete failure, these stores are seldom drawn upon more than two or three months in the worst of years; although, in the years 1848 and 1849, they were completely exhausted, on account of the failure of the crops for two successive years. In fact, in the spring of 1849, some places were rendered desert, by the entire population dying from want, and scurvy produced by bad living. Even in the best-organised villages, where the owners spared neither pains nor expense, the mortality was fearful. In the most favoured districts the mortality was at the rate of from five to ten per cent. in the course of the winter. What is very remarkable is, that at this very time, at a distance of perhaps 300 miles, corn was very plentiful, and selling at prices little above the ordinary rates; but as the tracks were all broken up, there were no means of transporting it—there being no roads, properly so called, in the interior of the country; and when the frost breaks up, the mud is more than knee-deep for a space of perhaps three weeks or a month, and sometimes two months, when the frost breaks up early—as it did in the year 1849, and again in 1853.

To give a faint idea of what a Russian road is like in its worst state, I shall just relate what occurred to a friend of mine who was obliged to travel from Ekaterinoslav to Kharkoff in the month of March, 1853; the distance is about 200 versts, or 140 English miles, and is generally done in twenty-four hours, or less, in the winter or summer. He was quite alone, without servant or luggage, except a small portmanteau, and travelled in the ordinary post-waggon, which will not weigh altogether more than three or four hundredweight—had five post-horses to it, the usual number being three; and, notwithstanding all this, he was seven days and six nights on the road, travelling day and night, as is the custom in Russia, there being no inns on the road where to stop. Now, if travelling by post is attended with so many difficulties in the spring of the year, what must be the expense and trouble of transporting corn at that time? It is utterly impossible, for its value would be doubled in about twenty-five miles.

The sufferings of the people during the years 1848 and 1849 were really dreadful. There was one proprietor who told me that he was obliged to leave his village, which was a small one, as all his peasants were dead, and he only made his escape with one man, who was his servant—that all the others were lying dead in their huts, without anybody to bury them. Scurvy in

its most malignant form was the disease that carried them off, which was no doubt produced by improper food; for in many instances straw was chopped up and mixed with the flour to make bread, which at the best of times is not very good, being quite black, and very coarse in appearance. Of this the quantity was so small, that it was insufficient to keep body and soul together.

The prices in the different Governments in the years 1746-9 inclusive have varied, according to locality and harvest:—

For rye, from 98 kopecks to 11 roubles 7 kopecks.
For wheat, from 2 roubles 19 kopecks to 13 roubles.
For grits, from 1 rouble 60 kopecks to 12 roubles 60 kops.
For oats, from 79 kopecks to 5 roubles 70 kopecks.

Thus the greatest difference of price was for rye, as 1 to 11; for wheat, as 1 to 6; for grits, as 1 to 8; and for oats, as 1 to 7. Such extraordinary variations are to be met with in no other country; and it is to be observed that the greatest difference of price takes place in rye, which is the grain most extensively cultivated in Russia, and constituting the principal food of the people, so that a fall in the price of this article is very ruinous for the producer, whilst an excessive rise is a calamity for the largest number of consumers. The variations are not wholly due to the vast extent of country and difference of climate; for in single governments, such as Courland, the fluctuation in the price of rye in the four years was between 1 rouble 17 kopecks to 11 roubles 7 kopecks: in Ekaterinoslav, between 1 rouble 30 kopecks and 5 roubles 20 kopecks; in Kowno, between 3 roubles 25 kopecks and 8 roubles 35 kopecks, and so on.—Blackwood's Magazine.

PARIS UNIVERSAL EXHIBITION.

TRIALS OF THRASHING MACHINES.

These trials were commenced on the 21st Aug., at a bazaar near the *Palais de l'Industrie*, under the superintendence of M. Moll. The machines were moved, in each case, by two horses, although for ordinary working it would have required four; but as the dynamometer was not applied, this could not be taken into account. The grain employed for the test was wheat, rather heavy in the straw, but in fine condition. The machines tried on the 21st and following day were as follow:—

Nos.	Makers' names	Country.	Weight of grain.	Time taken in minutes	Diameter of drum.	Diameter of hr. walk
			lbs.		ft.	ft.in
1	J. Pinet, jun.	Abilly, France	627	8.	19½	20.
2	Lotz, jun.	Nantes, ditto	614	12.	19	23.
3	Jasquet Roux	Issoudun, ditto.....	640	19.	25½	13.8
4	Renaud & Lotz	Nantes, ditto	592	14.	17	16.
5	Terrolle	Nantes, ditto.....	609	15.	18	21.
6	Kemmerer	Bromberg, Prussia	*		19½	24.
7	Drewitz & Co.	Thorn, ditto	623	15.50	16	20.4
8	Arthuis	Chateau Gortier, France	557	15.	20½	21.
9	Steinmig.....	Danzig, Prussia	620	15.	18	22.
0	Legendre.....	St. Jean d'Angelly, France	339	15.	18	19.

* Broke down.

The best horse-works, in our opinion, were those of No. 1, being simple, not liable to derangement, and moderately cheap. It goes uncommonly easy to the horses, and drives the machine by an over-head band.

No. 3 made the best work. It had a "bolting drum," and blew the corn once; but the horse-works were execrable.

Nos. 6, 7, and 9, from Prussia, were completely copied from English machines, and worked pretty well.

The great fault of all the machines, with the exception of No. 3, was to injure more or less the straw and corn. Nos. 2 and 10 literally cut it into chaff. We think that No. 6 would have done its work well; but one of the universal couplings gave way, from being made of cast-iron, therefore the trial could not be continued.

The machines which public opinion had stamped as the best were sent to the Conservatoire des Arts et Metiers, to be tried there. This took place on the 27th and 28th ult., under the direction of M. Tresca, engineer of this establishment, the motive power being a portable steam-engine by Tuxford of six horse-power. In these trials the dynamometer was not used; but the method employed was this:—The steam in the boiler was kept at the constant pressure of 60lbs., and the throttle-valve was regulated by hand, so as to know the quantity of steam used (this had been ascertained by experiments made on the engine); then, by counting the number of revolutions made, the power of the engine was found.

M. Tresca only knew these important results; but we think his method very liable to error.

Subjoined is a table indicating the quantities of grain passed through the machine, the time taken, &c.

Nos.	Makers' Names.	Country.	Weight of Grain. lb. averdupois.	Time. min.	sec.	Diameter of drum. in.	No. of revolutions of drum per minute.
1.	Pitts	Buffalo, U.S. America	2092	20	15	16	1205
2.	Paige and Co.....	Canada	838	10	20	16	950
3.	Cumming	Orleans, France ..	628	11		30	537
4.	Garrett	England	834	13	45	22	884
5.	Hornsby.....	Ditto	834	9	25	21	1024
6.	Clayton & Shuttleworth	Ditto					

Mr. Clayton not having received information until late, had no person to work his machine; consequently the trial of his machine was postponed.

The drums of No. 1 and 2 were "*pegged*," and No. 1 especially injured the corn a great deal, and broke the straw all to pieces. The straw is of course no consequence in the United States, therefore this is not looked upon as a fault in that country. The others were all "bolting drums," and the machines of Cumming, No. 3, and Hornsby, No. 5, did their work much the best, leaving both the corn and straw in an almost uninjured state.

We need scarcely add, these trials would be deemed in England quite unsatisfactory, from the absence of a dynamometer or steam-pressure indicator to the cylinder of the steam-engine.

The thrashing-machine of Messrs. Clayton, Shuttleworth, and Co. was tried on the 2nd Sept., and gave the following results:—It thrashed 800 lbs. of grain in 6 minutes 39 seconds. The diameter of its drum is 20 inches, making 1,008 revolutions per minute.

This machine made much better work than either of the others; perfectly cleaning the straw without breaking it, or injuring the corn. It very much excited the admiration of all present.

AGRICULTURAL STATISTICS.

In this nineteenth century of the Christian era, nearly four thousand years since a foreigner became Prime Minister of Egypt through predicting a succession of good and bad harvests, and at a time when undoubtedly a man may turn the information into as much money as he pleases, there is nothing people make such random guesses about as the prospects of the harvest and the probable supply of food for the next year. Yet hardly two people meet without offering some remark on the subject, either reporting what they have seen or retailing some current news. What makes it still stranger that there should be so little accurate or trustworthy information is, that it is very important not only to the country at large, but also to everybody in particular. Of course we can excuse young ladies and gentlemen for caring little about the matter. A table of statistics may be the death warrant of their earthly prospects; it may contain the certain premises of bankruptcy and ruin to their parents, their lovers, their friends; but that is no reason why they should be precociously learned in these dull hieroglyphics, and, if they are to be ruined, let them be spared the agonies of arithmetical warning. But older people don't all find figures so dull, and they are aware that it is important to know, at least as well as others, whether bread and meat are likely to be dearer before the next harvest, and how much dearer—whether a quarter or half as much again, or even twice as dear. It is not merely the cost of their households that concerns them. The wages of their artisans and the prosperity of their customers are far more important considerations. Corn and cattle are now dear enough; but were they to rise, as they have risen before this, nobody can say what amount of distress would result in our manufacturing towns. It would bring Sebastopol to the door of every working man in these islands. Is that a matter of indifference to any of our readers? Is general distress only a thing to have bazaars for, and coal funds for, and soup tickets for, and pleasant ambiguous gossiping and flirtation about; or is it really a thing to touch the heart, even before it comes home in the form of commercial disaster—third-rate houses, cheap lodgings, and going out as clerks and governesses? In spite, then, of the disgust which figures always create, in spite even of the suspicion under which statistics always have laboured, and in spite of our own belief that they always will be exposed to error and fraud, we will still venture to say it is desirable for all and each of us that we should have as correct information as can be obtained as to the stock of food in the world.

Various attempts have been made to procure this information, either by private persons, or by agricultural societies, or by Government authorities—sometimes through the clergy, sometimes through the Poor Law officials, in Ireland through the constabulary, with more or less success. The principal difficulty has been the unwillingness of farmers to take the trouble of filling schedules, which not only puzzle them and tax the memory, but even require a reference to their books, when all the time they are not at all sure they do themselves any good by disclosing the nakedness, or, as it may be, the wealth of the land. Farmers are not very communicative under any circumstances; they do not tell anybody what they expect to get off such and such lands, how many quarters an acre they expect from their wheat, and so forth. So we are not surprised to find that in the former inquiries of this sort farmers have sometimes declined to answer questions till their neighbours did. They would give no information unless they could have some in return. This implied a feeling that in answering questions they sacrificed somewhat of their position. Certainly, if a man by long experience and intimate knowledge of his land is able to make a particularly good guess, that guess is a secret of trade, and it guides him in buying and selling when others buy and sell at random. But a little consideration will serve to show that the market can never be much affected by the estimate of any one man, and that the supposed loss a man may suffer by blazoning his own guesses and calculations to the world must be infinitesimal and doubtful in the extreme. We cannot suppose that it will ever make one atom of difference to any farmer with regard to his own profits whether he tells the whole or not. The only real objection, then, is the difficulty of filling up schedules; and certainly it is not every man who understands the plainest schedules in the world. Those for the last census were generally laid aside in despair till the enumerators came to the aid of the distracted householders; and though magistrates, and clergy, and Poor Law guardians, and churchwardens may be supposed to possess some official and statistical capacity, they are quite as apt to flounder in filling up a blank return as other people.

Considering the great success, but still partial success, that has been obtained, and the evident fact that entire success is unattainable unless every means be taken to secure it, we are not surprised that the Committee in the Lords on Agricultural Statistics have recommended a very full and decided measure for the purpose. Premising that none are so much interested in the inquiry as those who are connected with agriculture, they recommend that occupiers of land shall be compelled to answer the questions, that the Board of Trade shall conduct the inquiry through the Poor Law officials in England, the Highland Society in Scotland, and the constabulary in Ireland; that two annual returns shall be obtained, viz., the average of each description of crop and the amount of live stock in July, and estimates of produce in November; that the returns be checked by the parish rate-books, and that all the necessary expenses shall be discharged by the Exchequer. The only points at all questionable in these recommendations are the compulsoriness of the returns, and the possibility of the expense being something exorbitant. With regard to the former point, if the inquiry is reasonable as a whole, there can be no reasonable objection to it, and therefore we need not hesitate to put every farmer as much under obligation to answer correctly as in the case of the census returns. If any farmer imagines he has a private interest in not answering, or anwering incorrectly, he must, by parity of reason, or rather as the necessary consequence of that opinion, believe the public at large to have a proportionate interest in knowing the truth. The public at large then takes him on his own admission, and compels him to do his duty to the State. For our part, we believe it a matter of great consequence to the nation to get at the truth, and of no consequence to any one farmer to withhold his very small portion of it. As to the expense, certainly that requires a cautious head; and when the Highland Society get an immense amount of valuable information for a few pounds, we think Parliament may well put a decided limit to the enthusiasm of English statisticians. The chief expense, as it seems to us, will be not the organization, the chiefs, the office, the

books or the papers, but the necessity of a class of officials, corresponding to the enumerators in the census, numerous and intelligent enough to assist every farmer in filling the return, for without such assistance we may be quite sure they will never be filled up, any more than the census papers would have been. These are the only two objections we can see to the scheme of the committee, and we cannot think they will be fatal to it.—Times.

ON FATTENING POULTRY.

PRIZE ESSAY.

BY W. B. TEGETMEIER.

The consideration of the best method of fattening live stock of any description may be most advantageously arranged under two heads, namely, the scientific principles which have been ascertained respecting feeding, and their practical application as verified by experience.

In the following Essay these subjects will be treated in separate chapters; so that those readers who require merely the practical details may omit the consideration of the scientific truths on which they are based.

Chapter I.—The Principles of Feeding.

Section I.—*The Purposes served by Food.*

The purposes served by food, when taken into the body, are of several distinct kinds, and may be spoken of as—

1. The production of animal warmth.
2. The supply of the materials required for the growth and waste of the muscles, &c.
3. The supply of the mineral and saline substances contained in the body.
4. The supply of the waste or increase of fat.

The warmth natural to living animals depends upon the consumption of a certain portion of the food in the process of breathing; the substances consumed in this manner are chiefly those which contain a large quantity of carbon, which passes off in the breath in the form of carbonic acid.

The most important warmth-giving foods are, starch, sugar, gum, the softer fibres of plants, and oily or fatty substances; as the natural warmth of an animal in health remains the same at all times, it necessarily follows that a larger supply of warmth-giving food is required in cold situations than in warm ones.

During motion, or under excitement of any kind, the breathing is hastened, and consequently a larger amount of carbon is thrown off by the lungs. In quietude and sleep, or the contrary, the breathing is slower, and the quantity of food consumed in this manner is lessened. These circumstances will render evident the utility of keeping fattening animals in a house of moderately warm temperature, and one sufficiently quiet and darkened to conduce to rest and sleep.

To supply the materials of the growth of young animals, and repair the waste arising from the daily action of the limbs and from other causes, a second variety of food is required, for the starch and other substances before enumerated *have been proved by direct experiment to have not the slightest action in supplying these wants.* Substances possessing this power may be termed flesh-forming foods. The most important are, the gluten, and similar substances existing in variable quantities in different grains; and in larger proportion in the varieties of pulse, as beans, peas, &c., and in the materials which form the solid parts of the flesh of animals, of eggs, of milk, &c. In consequence of their containing the element of nitrogen, which is wanting in the other varieties of food, these flesh-forming substances are frequently termed *nitrogenous foods;* whilst the fat-forming and warmth-giving are called *carbonaceous foods.*

The mineral and the saline substances contained in the bones and in other parts of the bodies of animals occur in larger proportion in the bran than in the inner part of the grain. A due supply of bone-making and saline materials is absolutely requisite to the growth of a healthy animal, as, if wanting in the food, the bones become soft, and the genera health speedily fails.

In reference to the present subject, those substances which supply the materials for replacing the waste or the increase of fat are the most important. It is still a point unsettled amongst scientific authorities whether the starchy materials before spoken of as warmth-giving food are, or are not, capable of being converted by the living forces of the body into fat, although there is but little doubt that under favourable circumstances they are so; but it is unquestioned that where it is desired to fatten animals *rapidly* (or to supply fat to be consumed in generating warmth, as is necessary in all cold regions), it is the absolute requisite that the food eaten should contain oily and fatty matters which can be readily absorbed by the digestive organs, and either stored up or applied to the immediate wants of the body. There appears no doubt but that the fatty materials in the food are rapidly absorbed by the body without undergoing much alteration, therefore the nature of the food influences very greatly the character of the fat; and, not to seek for examples beyond the animals whose fattening is at present under consideration, the writer knows of an extensive feeder of geese who always sends his birds to market in an excessively fat condition, but which, nevertheless, do not command the prices paid for some others in a less fatted state, from the very soft and oily character of the fat, and its being known to lose excessively in cooking. This feeder keeps his process of feeding a secret; but there is little doubt but that oilcake or linseed enters largely into his dietary. The rapid fattening effects of cod-liver oil on men and animals prove also that fatty substances can be rapidly assimilated by the vital powers; and the following extract from the eleventh volume of the *Pharmaceutical Journal* substantiates the fact that they are absorbed without undergoing much change:—

"A quantity of refuse cod livers were sent into the country, and turned under some rubbish, for the purpose of forming manure. Some time after, several pigs discovered the treasure, and fed extensively upon it; although not put up to fatten, they became in very high condition—so much so that they were killed without any further preparation. On dressing them it was found that the fat was yellow, and the flesh very peculiar; during cooking it gave out a very strong smell, similar to that of boiled cod livers, and was so offensive that it was unfit for food; in fact, it was saturated with the oil, which even exuded from the lean when pressed. The fat of the pork did not solidify, but was soft, and smelt like rancid cod liver; even the lungs and the liver appeared saturated with oil; the hams had the appearance of having been soaked in that liquid, and could not be made to take the salt. This circumstance appears to prove that the fatty matters are absorbed without their sensible qualities being altered; the liquid character and rancid flavour of the cod liver oil affecting the fat of the pork."

SECTION II.—*Examination of the Substances used in Fattening Poultry.*

Supposing the principles above-stated be correct, and both theory and practice tend to prove their perfect truthfulness, it is obvious that the value of any substance, used as a food for fattening animals, can only be ascertained by a reference to the relative quantity of warmth-giving, flesh forming, and fat-forming materials it contains; and such an examination will give us a true index of its money value, and enable us to ascertain how far the practice of feeders has been based upon right principles.

OATS and OATMEAL.—Oats or Oatmeal are perhaps more largely employed than any other grain in fattening poultry; and, in this case, the experience of feeders strikingly corresponds with the results afforded by scientific examination. Oatmeal contains, in every 100lbs., 6lbs. of fat or oil, 18lbs. of flesh-forming, and 63lbs. of starchy materials. Oats contain the same quantity of fat in every 100lbs.; but in consequence of the large proportion of husk, the quantity of flesh-forming and starchy substances is lessened to 15lbs. of the former, and 47lbs. of the latter: thus oats are not as valuable for fattening purposes as oatmeal; especially as, from the presence of the husk, and their undivided state, they are not so rapidly digested.

WHEAT and BRAN, MIDDLINGS, &c.—Wheat, in its entire state, contains only one-half the fatty materials of oats, and hence it is not usually employed in fattening. The fat of wheat resides *almost entirely in the outer portions*, which, when removed, constitute bran, pollard, and middlings; the latter, or finest bran, has been remarked by Professor J. Johnston as being almost similar in its composition to oatmeal, being much richer in both fat and flesh-forming foods than the inner parts of the grain. Its value in fattening pigs has been long known; and the writer can speak, from long experience, that it is equally efficacious in fattening poultry. It contains 6lbs. of fat, 18lbs. of flesh-forming, and about 53lbs. of warmth-giving food in every 100lbs.

BARLEY and BARLEY-MEAL.—Barley is not advantageous as a fattening food, as its per-centage of fat is very low, being not more than 2lbs. in every 100lbs.

INDIAN CORN.—Indian Corn is remarkable for the large quantity of oil contained in yellow varieties—nearly 8lbs. in every 100lbs. Its capability of supplying flesh is not so great as that of oatmeal; hence it is not well adapted for laying-hens, which it renders too fat; but this peculiarity fits it remarkably for fattening poultry, for which purpose it is largely employed in the United States.

RICE.—Rice is one of the least advantageous foods either for fattening or supplying flesh; it contains only a trace of fatty materials, and less than half the quantity of flesh-forming food contained in oats.

PEAS and BEANS.—All the varieties of pulse contain a much larger proportion of flesh-forming or nitrogenous substances than any grain; in fact about 25 per cent., or double the quantity contained in wheat; whilst the proportion of fat is not more than 2 in the 100. This composition admirably fits them for the support of the animals undergoing much muscular exertion; given to fatting animals, they are apt to harden the fibre, as in the well-known case of bean-fed bacon; and the elaborate experiments of Mr. Lawes, in pig and sheep-feeding, prove most distinctly that the increase in weight of a fatting animal is dependent on the carbonaceous, and not on the nitrogenous constituents of its food.

MILK.—Milk is a most advantageous addition to the food of poultry, as it contains 3lbs. of fat (butter), nearly 5lbs. of warmth-giving (sugar of milk) and 4½lbs. of flesh-forming food (curd), in every 100lbs. Skimmed milk, or butter-milk from having had the fat removed, are by no means so advantageous.

ANIMAL FAT.—If any pure fat is given to fatting fowls, it is evident, from what has been previously stated, that it should be of as solid a character as possible; for as it is assimilated without much change, it is evident that the firm character of the fatted poultry is much increased by it. The evil effect of linseed-cake upon geese has already been alluded to, arising from the liquid condition of the oil contained in it; the best addition to the food of poultry consists, therefore, of the hardest and cheapest variety of common fat, namely, mutton suet, or what is equally good, the paring of the loins, which are at present sold to the tallow melter.

COOKING FOOD.—One other circumstance remains to be considered in this section, namely, the alteration effected in food by cooking. The influence of heat is chiefly exerted, in the case of vegetable foods, on the starch, which constitutes so large a portion of all grain: this, in its natural state, consists of small granules, which are (as in the well-known case of arrowroot, a very pure variety of starch) insoluble in cold water, from the circumstance that each is coated with a firm membrane; when heated to a degree somewhat short of boiling water, this membrane cracks, and the interior gummy portion of each granule dissolves in the water and thickens it. There is no doubt but that starch, thus altered, is more readily and rapidly digested than in its insoluble state; hence the advantage of cooked food for fattening pigs, and the desirability of employing boiling water to scald the meal used in fattening poultry.

It may perhaps lead to easier understanding of the relative value of the different kinds of food, if their constituents are stated in a tabular form, it being borne in mind that such statements are merely approximations to the truth, as the composition of grain varies with the character of the season and the soil.

TABLE, SHEWING THE COMPOSITION OF THE SUBSTANCES EMPLOYED IN FATTENING POULTRY.

Every 100lbs. of	Fat or Oil.	Flesh forming Food.	Warmth-giving Food	Mineral Substances.	Husk or Fibre.	Water.
Oats..... contain	6	15	47	2	20	9½
Oatmeal	6	18	63	2	2	9
Wheat.....	3	12	70	2	1	12
Middlings (fine Bran)..	6	18	53	5	4	14
Barley	2	11	60	2	14	11
Indian Corn	8	11	65	1	5	10
Rice.....	A trace	7	80	A trace	—	10
Beans and Peas	2	25	48	2	8	15
Milk	3	4½	5	¾	—	87

CHAPTER II.—THE PRACTICE OF FATTENING.

SECTION I.—*Selection of Breed.*

In fattening poultry for the large markets, no success can be expected unless suitable varieties are selected. In fowls, as in other domesticated animals, some varieties are much more readily disposed to fatten than others; and one breed may be characterized by the tendency to accumulate fat internally, and another externally.

To those who have had extensive experience in the different breeds, there can be no question as to the best variety for table purposes. The coloured Dorking surpasses, in this respect, all other kinds; its superiority consisting in the large size it attains at an early age, in its short legs and compact form, in the fineness of its bones, and the small quantity of

offal, in the quantity of flesh upon the breast, in the extreme whiteness and delicacy of the meat, and the readiness with which it fattens. The large Surrey fowls, which are only to be distinguished from the Dorking by the absence of the fifth toe, are equally valuable for table purposes.

The white Dorking, as at present known, is not to be strongly recommended, as it is evidently a distinct variety from the coloured; the size, carriage, and general form of the birds being dissimilar. The only drawback to the superiority of the Dorking consists in the delicacy of the breed when chicken; this, on heavy clay land, or in damp situations, is a serious evil. Under such circumstances, many persons of great experience recommend crossing the breed, by having a large Malay or Cochin cock with Dorking hens, or a Dorking cock with Cochin or Malay hens; care being taken not to rear any of the cross-breed chickens for stock, but to fatten them all for the table. By this means, greater hardihood and large size may be obtained; but the writer has never succeeded in rearing such chicken with the plump breasts and short limbs of the pure-bred Dorking.

Should it be deemed desirable to cross the Dorkings for the purpose of producing a hardier fowl, such a plan as the following seems to offer the best chance of success, being based upon the fact that in cross breeding the pullets usually resemble the mother, and the cockerels the father:—Early in the year, so as to obtain a brood in May, put two or three large Dorking hens with a short-legged, compact Cochin cock, either of the common buff, or of the grey variety known as Brahma Pootras. From the chicken select those pullets possessing in the greatest degree the Dorking character, viz.—having fine bone, short white legs, and compact body, square on the limbs; and, in the following season, mate these with a good Dorking cock. The progeny thus obtained from them will be three-fourths Dorking, and, if care is taken in the selection, will show very little trace of Cochin blood; whilst the size and constitutional hardihood of the breed would be much improved by the infusion of new blood from the hardiest of races. One caution, however, would be requisite:—if these birds were allowed to breed amongst themselves, they would occasionally throw back to the Cochin; it would therefore be necessary to mate the pullets again with a Dorking cock; and, as in all cases of breeding for size and strength, great care must be taken to avoid breeding closely, viz., from birds related to each other.

Cochins, although of great weight, cannot be recommended as a profitable market fowl; their small breasts, yellow skin and fat, game-like flavour, coarseness of bone, and length of limb, being much against them; and it is almost impossible to render them fat upon the breast, as they have an unusual tendency to accumulate fat internally. It should be remembered, that unless a fowl has naturally a full chest, it is impossible to put flesh or muscle on it by fatting; for there is this distinction between the flesh of quadrupeds and that of birds—that in the former, the flesh can be increased in size by the intermixture of fat between the fibres, which gives rise to the marbled appearance seen in prime beef. This, however, cannot be done in the case of birds, their muscles being always destitute of fat, which is deposited under the skin, or in the interior of the body only.

Section II.—*Breeding.*

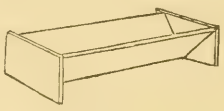
In rearing fowls for the market, the early treatment of chickens is of the highest importance; they should be warmly sheltered, and housed, and moreover fed most liberally at very short intervals. If a chick receives a check in its growth at an early age, it never afterwards attains a large size, as the bony frame becomes set, and a stunted growth is the enevitable result.

With good and abundant feeding, and the advantage of a free run, in favourable weather, Dorkings will become fit for the purpose of fattening at the age of three to four months in summer, and four to five or six in winter. In order to be in the highest perfection, fowls must be killed before they have arrived at their full development: the male birds should be taken when the sickle feathers of the tail begin to show, or, as the country women say, "when their tails begin to turn;" and the females, whilst still pullets, viz.,—before they have laid.

Section III.—*House, Coops, &c.*

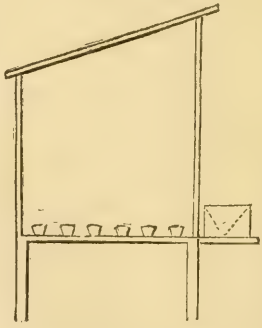
The house in which poultry are fattened should be free from draughts of cold air, and kept at a moderately warm and uniform temperature; the roof therefore, if of tiles, should be thickly lined with straw. Quietude being so especially desirable, it should be so situated as not to be accessible to those fowls at liberty; and it should be partially darkened, if possible. It is also important in the highest degree that it should be perfectly dry, as it is scarcely necessary to add that a fowl suffering from cold and inflammation is not likely to fatten.

The fatting coops should be two feet six or eight inches high in front, and about two feet deep, with a boarded roof sloping backwards, as shown in the end view; the back and ends should be closed, and the bottom made of flat bars with rounded edges, two inches wide at the top and narrow beneath (as shown in the section), so as to prevent the dung sticking to the sides. These bars should run from end to end of the coop (not from back to front), and they should be two inches apart on the upper sides. The front of the coop should consist of rounded bars, three inches apart, and two rods connected together below, and sliding through holes made in the roof, will be found more secure than a door. Before the front should run a ledge to support the feeding troughs, which are best made by joining two pieces of wood at a right angle, and securing the ends by letting them into grooves in stout end pieces, as shown in the sketch.

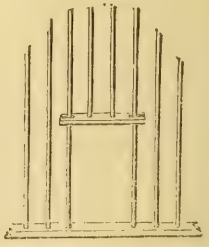


Feeding Trough.

Enlarged view of portion of a bottom Bar shewing its shape.



End View of Fatting Coop and Trough.



Arrangement of sliding Bars in place of Doors.

The fatting coops should stand on legs, to raise them a convenient height from the ground, so that the dung may be

removed daily; the most scrupulous cleanliness must be observed, otherwise disease will be produced. The coops, therefore, should be frequently lime-washed (with freshly slaked lime and water), and then thoroughly dried before a fresh batch of fowls are introduced.

In cold weather the front should be covered up with matting, or some other warm material, at night.

The length of the coop must depend on the number of fowls that it is required to contain; but it is never advisable to place more than ten or a dozen together: and if strange fowls are put up, care must be taken that they agree well together, as otherwise the constant excitement would prevent their fatting.

It occasionally happens that fowls are infested with lice to such a degree that they become irritable, and refuse to fatten; in these cases, a little flour of brimstone dusted under the feathers, before cooping them, immediately expels the vermin.

Section IV.—*Food.*

The food usually selected for fattening poultry is oatmeal mixed either with scalding milk or water; the cause of the superiority of this meal over that of barley has already been stated. Cooped fowls should be supplied with fresh food three times daily, namely—at day-break, or as soon after as possible, at midday, and again at roosting time; as much as they can eat should be given on each occasion, but no more than can be devoured before the next meal; should any be left, it should be removed and given to the other fowls; as, if kept, it is apt to become sour, when the birds will not eat it freely. The troughs for the soft meat should be scalded out daily, which can only be done conveniently by having a supply of spare ones.

In addition to soft food, a supply of fresh clean water must be constantly present, and a little gravel must be given daily; otherwise the grinding action of the gizzard, which is necessary to the due digestion of the food, does not go on satisfactorily; the supply of a little green food will be found very advantageous to health; a little sliced cabbage, or some turnip tops, or a green turf to peck occasionally, being all that is required.

A variation in the diet will be found very conducive to an increased appetite, and therefore the occasional substitution of a feed of boiled barley, for the slaked oatmeal, is desirable. Some feeders have a division in their troughs, or, still better, a small extra trough, which always contains some grains for the fowls to peck at.

Should the birds be required very fat, some mutton suet or trimmings of the loins may be chopped up and scalded with the meal, or they may be boiled in the milk or water preparatory to its being poured over the food, and the fat of fowls so fatted will be found exceedingly firm.

An objection to this mode of fatting will probably be made, namely, that it is expensive owing to the cost of the oatmeal. In the yard of the writer, this objection has been removed by the partial substitution of fine middlings for oatmeal. The plan adopted is to bake the middlings dry, and when made as hot as possible, without burning, cold water is added so as to make the whole a crumbly mass. When it is borne in mind that the constituents of fine middlings are nearly the same as those of oatmeal, its value as a fattening food must be admitted; and the writer, from long experience, can speak very decidedly as to its utility when used in conjunction with oatmeal.

In the course of about a fortnight to three weeks at the utmost, a fowl will have attained, under this system of feeding, the highest degree of fatness of which it is capable, and it must then be killed; for if the attempt be made to keep it any longer in that state, it becomes diseased from an inflammatory action being established, which renders the flesh hard and even unwholesome.

When the fowls have arrived at a state fit for killing, they should be kept for twelve hours without food or water, in order that the intestines may be as empty as possible, otherwise the bird turns green and useless in a short time; this is readily managed by killing the bird before feeding-time in the morning.

The writer has never found it requisite to have recourse to the unnatural practice of cramming; but as a description of the process may be supposed to be essential to an essay on fattening fowls, an account is inserted.

In cramming, the usual plan is to mix the oatmeal rather solid, with milk or water, and to roll it into small sausage-shaped masses, the size of the finger, and about two inches long; half a dozen of these are taken, and having been dipped in some liquid, as milk, are placed one after the other in the back part of the mouth of the fowl, when the beak is closed, and the mass gently assisted down the throat by the latter being stroked by the hand, before a second is inserted.

The birds are crammed in this way two or three times a day, care being taken to ascertain, by gentle handling, that the last meal has passed through the crop; should this not be the case, more is not given, but some lukewarm water is poured into the mouth to loosen the hardened mass, and prevent the bird becoming crop-bound, an evil which would render it useless for the table.

The fattened Dorkings prepared for the London market by the plans above described are frequently termed capons, but incorrectly, as the operation of caponizing has not been performed on them; in fact, it is not required if the birds are cooped before they have arrived at maturity; and the extremely severe nature of the operation in fowls, as compared with the corresponding one on quadrupeds, renders it attended with so much risk and loss, that it is very seldom practised in this country.

In conclusion, a few words may be said respecting fattening the other varieties of domestic poultry.

Turkeys, if well fed, scarcely require any fattening process. Should, however, it be deemed requisite, they may be confined within a moderate range, and liberally supplied with meal and milk, with occasional green food, as recommended for fowls. Barley meal is usually employed, but its inferiority to oatmeal has already been insisted on.

Geese.—Geese are also, if well kept, usually in sufficiently good condition for killing. Should it be required to fatten them, several together should be confined in a comfortable shed, kept very clean by the daily removal of the soiled litter; and they may be fed for a fortnight on oats thrown into a pan of water; and should they be required still fatter, an additional ten days' feeding on scalded meal, or middlings and meal, will be found all that is requisite; a little green food and gravel being given at the same time.

When geese are killed very young, they are usually termed green geese; and for this purpose, it will be found more desirable to restrict them from the water than to allow them free access to it, as they fatten more readily, and attain a larger size at their early age.

Ducks.—Ducks, from being not at all particular in their diet, require to be confined to clean food some days before they are killed. If they are shut up in a shed, or confined in a small enclosure, and liberally fed with whole oats in water, and meal slaked, they will be found, in a fortnight, to have become sufficiently fat for all useful purposes. It is not

essential that they should have water to swim in during fattening; in fact, such exercise rather lessens than tends to increase the accumulation of fat.

The early ducklings that realize such high prices in the London markets are of the Aylesbury variety; distinguished by their great size, white plumage, and large pale flesh-coloured bills. If fed with an unlimited supply of oats placed in a vessel of water, and not allowed much room to swim, the old birds will lay freely in winter; when the eggs should be hatched under hens, and the ducklings liberally fed with slaked oatmeal and fine middlings, and afterwards with oats in water. Under this treatment they may be made ready for the table in less than two months, and yield a very remunerative return. Ducklings invariably grow much more rapidly if kept from swimming, than if allowed free access to a pond or river.

Wood Green, Tottenham, near London.

MANCHESTER AND LIVERPOOL AGRICULTURAL SOCIETY.

The annual meeting of this society took place on Thursday, the 6th Sept., at St. Helen's, where the display of implements was fully as extensive as usual, and many of them attracted much attention, being carefully examined by those practically interested in agriculture. The principal exhibitors were Messrs. Richmond, Chandler, and Norton, Manchester and Liverpool; R. Forshaw and Co., Liverpool; Mr. T. Standing, Preston; Mr. W. Coulson, York; Mr. H. Chamberlain, Kempsey, near Worcester; Messrs. Clayton, Shuttleworth, and Co., Lincoln; Mr. T. Whalley, Liverpool; Messrs. B. Greening and Co., Manchester (chiefly of patent wire fencing, &c.); Mr. D. Harks, Knutsford; Mr. W. Young, Gerard's-bridge, near St. Helen's; and Mr. W. H. Peake, Liverpool. Silver medals, for their general collections, were awarded to Mr. Whalley, and to Messrs. Richmond, Chandler, and Norton; and Mr. Whalley also received a medal for a nine-row lever corn and seed drill. The following other prizes were given:—Mr. Chamberlain, for his patent brick-making machine (medal); Mr. William Pollitt, of Clayton-le-Dale, Blackburn, for a churn; Mr. John Starkey, Liverpool, for a wringing and mangling machine; Messrs. Greening, for a patent machine-made portable fence (silver medal); Mr. Harkes, for a compound lever cheese press (medal); and Mr. Pemberton, Sankey Lodge, Warrington, for a potato sorter (medal). Messrs. Richmond, Chandler, and Norton exhibited a crushing machine, intended to enable maltsters and brewers to comply with the recent order from the Inland Revenue Office, which received a good deal of attention. They also exhibited an extensive and varied assortment of chaff cutters, corn and linseed crushers, root washers, improved steaming apparatus, sack-holders, turnip cutters; all of that excellent workmanship and simple construction for which the firm has been so long remarkable. A prize of £3 was awarded for the excellent workmanship; and if the funds of the society could have afforded a larger sum to have been placed at the disposal of the judges, more justice would certainly have been done for those who have done so much for the benefit of agriculture. The exhibitions of articles by Messrs. F. and A. Dickson and Co., of Manchester, excited much interest.

The following are the prizes awarded:—

IMPLEMENTS.

JUDGES—Dr. Sillar, Ramford, near St. Helens.
Mr. Francis Twining, Parbold Hall, near Wigan.

To Messrs. Richmond, Chandler, and Norton, Salford, for a general collection, £3.

To Messrs. R. Forshaw and Co., Liverpool, a silver medal.

To Mr. H. Chamberlain, Kempsey, near Worcester, a silver medal.

To Mr. W. Pollitt, Clayton-le-Dale, near Blackburn, for a churn, 10s.

To Mr. J. Starkey, Liverpool, for one washing, wringing, and mangling machine, and one wringing and mangling machine, 10s.

To Mr. T. Whalley, Liverpool, for the collection, a silver medal and £1.

To Messrs. B. Greening and Co., Victoria Iron Works, 1 and 3, Church Gates, Manchester, for general collection, a medal.

To Mr. D. Harkes, Mere, near Knutsford, a medal.

To Messrs. J. Dickson and Sons, Chester, for a selection of gardening and horticultural implements, £2.

To Messrs. F. and A. Dickson and Co., Manchester, for a selection of gardening and agricultural implements, £2.

To Mr. J. Seddon, of Ramford, for a cultivator, the silver medal.

CATTLE.

JUDGES—Mr. Henry Fisher, Westby, Kirkham, near Preston.
Mr. Joseph Woolf, Haslingden Hall, near Crewe.

SHORTHORNS.

For the best bull, above two and under four years old, first prize of £10 to Mrs. Winder, Lathwaite, near Garstang; second prize of £5 to E. Bate, Kelsterton, near Flint.

For the best bull, above one and under two years old, first prize of £8 to E. Bate, Kelsterton, near Flint; second prize of £4 to R. C. Lowndes, Rice House, Club Moor, near Liverpool.

To the tenant farmer, for the best bull, of any breed, above two and under three years old, first prize of £6 to J. Gorton, Seedley, near Manchester; second prize of £3 to Messrs. Mortimer and Tait, Heaton Mersey, near Stockport.

To the tenant farmer, for the best bull, of any breed, above one and under two years old, first prize of £5 to J. Dickenson, Upholland, near Wigan; second prize of £2 10s. to T. Forrest, Spurstow Hall, Tarporley.

To the landlord who shall keep the best bull, of any breed, to serve the cows of his tenantry, gratis, the society's silver medal. T. J. L. Brooke, Mere Old Hall, near Knutsford.

CATTLE OF ANY BREED.

For the best cow or heifer, of any breed, in milk or in calf, first prize of £5 to E. Bate, Kelsterton, near Flint; second prize of £2 10s. to Samuel Clough, Ashton, near Warrington.

For the best two-year-old heifer, of any breed, first prize of £5 to E. Bate, Kelsterton, near Flint; second prize of £2 10s. to J. Forrest, Stretton, near Warrington.

For the best yearling heifer, any breed, first of £3 to E. Bate, Kelsterton, near Flint; second prize of £1 10s. to R. Helsby, Baguley Lodge, Northern, near Manchester.

To the tenant farmer, for the best cow for dairy purposes, in milk or in calf, first prize of £5 to S. Clough, Ashton, near Warrington; second prize of £2 10s. to J. Gorton, Seedley, near Manchester.

To the tenant farmer, for the best pair of two-year-old heifers of any breed, prize of £3 to T. Forrest, Spurstow Hall, Tarporley.

To the tenant farmer, for the best pair of one-year-old heifers of any breed, first prize of £3 to T. Forrest, Spurstow Hall, Tarporley; second prize of £2 to S. Dorning, Little Wardley, Swinton, near Manchester.

To the farmer, not being a cattle dealer, who shall show the best lot of milch cows, not less than six in number, first prize of £5 to J. Gorton, Seedley, near Manchester; second prize of £2 10s. to D. Bromilow, Haresfinch House, near St. Helens.

To the tenant farmer, not being a cattle dealer, who shall show the best lot of calves, of his own rearing, not less than six in number, not more than ten months old, first prize of £3 to J. Dickenson, Upholland, near Wigan; second prize of £1 10s. to S. Dorning, Little Wardley, Swinton, near Manchester.

EXTRA STOCK.

Highly commended, B. C. Lowndes, Rice House, Club Moor, near Liverpool—shorthorned bull, "Bellerophon" (11,165).

HORSES.

JUDGES.—Mr. R. T. Beckett, Oulton, near Tarporley.
Mr. R. Walker, Thistleton, near Kirkham.
Mr. Wright, St. Helens, acted as Consulting Veterinary Surgeon.

For the stallion best adapted for agricultural purposes, first prize of £6 to J. Robinson, Broughton, near Manchester; second prize of £3 to I. Hampson, Lostock Hall Farm, near Poynton, Cheshire.

For the best stallion for dray purposes, first prize of £6 to G. Wilson, Wolton Hill, near Liverpool; second prize of £3 to J. Robinson, Broughton, near Manchester.

For the best stallion adapted for road purposes, prize of 6*l.*, to T. Statter, Stand, Bury.

To the landlord who shall keep the best stallion for agricultural purposes, to serve the mares of his tenantry gratis, the society's silver medal, G. Greenhall, M.P., Walton Hall, near Warrington.

For the best brood mare for agricultural purposes, 5*l.* to R. C. Lowndes, Rice House, Club Moor, near Liverpool.

For the best brood mare for roadsters or coaching, first prize of 5*l.* to T. Townley Parker, Astley Hall, Chorley, Lancashire; second prize of 2*l.* 10s. to William Palin, Stapleford Hall, near Chester.

For the best three-year-old gelding or filly for agricultural purposes, first prize of 5*l.* to David Bromilow, St. Helens; second prize of 2*l.* 10s. to John Taylor, Dutton Hall, near Preston Brook.

For the best two-year-old gelding or filly for agricultural purposes, first prize of 4*l.* to Henry Lowe, Dutton Hall, near Preston Brook; second prize of 2*l.* to Mrs. Margaret Tyrer, Aintree, near Liverpool.

For the best one-year-old gelding or filly for agricultural purposes, first prize of 3*l.* to I. Hesketh, Moss House, Worsley, near Manchester; second prize of 1*l.* 10s. to Mrs. E. Hughes, Sherdly Hall, near St. Helen's.

For the best three-year-old half-bred gelding or filly, first prize of 5*l.* to J. Forrest, Stretton, near Warrington; second prize of 2*l.* 10s. to C. Garfit, Tabley Old Hall, near Knutsford.

For the best mare or gelding, in actual use in the district as a roadster, first prize of 5*l.* to T. J. L. Brooke, Mere Old Hall, near Knutsford; second prize of 2*l.* 10s. to J. B. Barrow, St. Helen's.

For the best pair of draught horses employed in the district, and belonging to one party or concern, first prize of 4*l.* to R. Lupton, 4, Parr-street, Liverpool; second prize of 2*l.* to W. Webster, Church-street, St. Helen's.

To the tenant farmer, principally dependent upon farming, for the best pair of horses for agricultural purposes, and which are his own property, first prize of £5 to J. Dickenson, Upholland, near Wigan; second prize of £3 to W. Longton, Rainhill, near Prescot.

EXTRA STOCK.

The medal to T. T. Parker, Astley Hall, Chorley, Lancashire, for a stallion of the cart-horse breed.

The medal to the Right Hon. the Earl of Derby, Knowsley, for a mare (with foal) by Briton.

SHEEP.

JUDGES.—Mr. J. C. Etches, Harley Thorn, near Stone.
Mr. J. Carrington, Croxden Abbey, near Uttoxeter.
Mr. T. Hampson, Heaton House, near Manchester.

For the best Southdown ram, prize of £3 to Llewellyn F. Lloyd, Nannerch, near Mold.

For the best pen of five shearling Leicester ewes, £3 to J. W. Patten, M.P., Bank Hall, Warrington.

For the best pen of five Leicester breeding ewes, £3 to J. S. Wilson, Norton Hill, near Preston Brook.

For the best Leicester ram, £3 to J. S. Wilson, Norton Hill near Preston Brook.

For the best shearling ram, £2 to J. W. Patten, M.P., Bank Hall, Warrington.

For the best pen of five shearling ewes, of the short-woolled breed, £3 to R. C. Lowndes, Rice House, Club Moor, near Liverpool.

For the best pen of five short-woolled breeding ewes, £3 to T. T. Parker, Astley Hall, Chorley, Lancashire.

For the best short-woolled ram, £3 and silver medal to T. T. Parker, Astley Hall, Chorley, Lancashire; second prize to Ll. F. Lloyd, Nannerch, near Mold.

For the best shearing short-woolled ram, £2 to Ll. F. Lloyd, Nannerch, near Mold.

PIGS.

JUDGES.—Same as for Sheep.

For the best boar of the large breed, not more than three years old, first prize of £3 to P. Wright, Church Minshall, near Middlewich; second prize of £2 to H. Baxter, Sutton Place, St. Helen's.

For the best boar of the small breed, not more than years old, first prize of £3 to S. Ashton, Peter-street, Manchester; second prize of £2 to Mr. J. Hindson, Barton House, Breck-road, near Liverpool.

To the landlord who shall keep the best boar to serve the sows of his tenantry gratis, the Society's silver medal to G. Greenall, M.P., Walton Hall, near Warrington.

For the best sow of the largest breed, not more than three years old, first prize of £3 to J. Harrison, jun., Lancashire Hill, Heaton Norris, Stockport; second prize of £2 to J. Rose, College-street, St. Helen's.

For the best sow of the small breed, not more than three years old, first prize of £3 to J. Hindson, Barton House, Breck House, Everton, Liverpool; second prize of £2 to C. Beswick, Turncroft-lane, Stockport.

EXTRA STOCK.

For a sow of the large breed, the medal to G. Greenall M.P., Walton Hall, near Warrington.

TANNER'S BARK is the woody fibre or bark of oak trees, that has been used for the purpose of imparting the tannin principle to leather in the pits, and is thrown out as useless after the soluble parts have been extracted. It is long in fermenting, and resists putrefaction; and though very absorbent and retentive of moisture, it is impenetrable to the roots of plants. It is much used by gardeners in pine-apple pits for producing and retaining heat, which purpose it effects without any mixture. Bark and leaves of trees require long time and much mixing and preparation to reduce the substances to mould. Hot lime will be the quickest solvent for fresh bark; and the destruction of the fibre being effected, earths and dung may be added, which will bring the whole mass into a soluble and putrescent state. Hot stable-dung has been used in the first application, in order to reduce the woody fibre, but caustic lime is stronger and quicker; and after the dissolution has been effected the mild materials may be added, and the mixture completed. Time will effect a dissolution of the fibre without any mixture with the bark, but a long period will elapse; and it is usually preferred to dissolve it by hot-applications. The reduced mixture may be used as a manure for any purpose, but chiefly for top-dressing, from its finely divided and comminuted state.

SANITARY IMPROVEMENT IN THE SLAUGHTER-HOUSE, LARDER, AND BUTCHER'S SHOP.

This question divides itself into two heads:—Our present state, and means of progress. In the former our readers are interested in a threefold manner. First, from the increase which is taking place in the dead-meat trade; secondly, from the improved quality of meat involved; and thirdly, from the purer atmosphere and better health which would consequently be obtained. Advantages so important will readily be admitted as worthy of more detailed notice.

First, then, the carcase trade is fast superseding the live stock in all our large towns; and such is the rapidity of the increase of sales in the former, that the latter is liable to become extinct at no distant date. Now, the change which is here taking place is removing the nuisance of slaughtering from our large towns to the country, and consequently is increasing the interest of the farmer in sanitary reform in the slaughter-house. It does so in more respects than one, as the live stock and dead-meat trade of the capital shows. For example—

When the atmosphere of the slaughter-house is once allowed to become tainted by putrid matter, it inoculates newly-slaughtered meat by entering its pores—analogous to what takes place in the vaccination of children; consequently the work of decomposition commences immediately, and by the time the carcase reaches Newgate it is beginning to get discoloured, fetching, as a matter of course, a less price than it would have done had the carcase salesman received it in a sound, or, as it is technically termed, "blooming" state.

Again, when the carcase thus becomes inoculated, it never "sets" so well in the cooling as when in a pure atmosphere; so that the meat is not only soft and flabby, but undergoes a sort of sausage-making on the bone on being conveyed to the capital; hence the consequences which follow. In point of fact, the incipient fermentation which takes place, on the carcase becoming thus inoculated, generates heat (especially in warm weather), and when it is wrapped in a cloth and placed in a hamper, and that hamper packed along with others into a truck covered with an air-tight tarpaulin, the work of fermentation is accelerated; thus incurring proportionally greater losses.

In this manner, or as a natural consequence, the diseased carcase inoculates all the meat in the railway-truck, and others with which it may afterwards come in contact by means of a polluted atmosphere, until finally disposed of by the butcher. One farmer, for example, may by the use of improved sanitary means (as subsequently noticed) slaughter and set his meat in a pure atmosphere, keeping his carcase-clothes and hampers perfectly clean and sweet; but if his hampers are placed above those containing inoculated meat in the railway-truck, the consequences need not be mentioned. And similar results will be experienced when the sound carcase is placed in the carcase-salesman's or butcher's shop, the atmosphere in them being tainted either by dirt and putrifying offal, or by carcases in a putrifying state consigned from the country. From the solvent and impregnating character of the effluvia of putrid meat, the loss sustained in the dead-meat trade is of such a magnitude as not to be very easily estimated either by the farmer or butcher, the quantity annually sent to the knacker's caldron in the capital being incredible; besides the general deterioration experienced, in which the public bear a heavy share.

We have said when the atmosphere begins to smell, it proves it is in a diseased state capable of inoculating meat; but long before the nasal organs of man, generally speaking, can detect the progress of putridity, the atmosphere may be in such a vitiated state as to do harm. It is necessary to draw attention to this fact, lest any should erroneously come to the conclusion that because they perceive no smell, therefore their slaughter-houses, larders, and shops are perfectly sweet, and free from putrid matter. The nose of a blue-bottle fly will be drawn to a joint of meat long before that of either the farmer or butcher; and this simple fact ought to convince both that their olfactory nerves are not sufficiently sensitive to save them from the dangers at issue. Moreover, the question being to prevent smell, not detect it, our nasal organs must give place to the eye, with deodorising, antiseptic, and other chemical agents.

Nor is the loss which the farmer sustains confined to the carcase trade, he being indirectly a large loser also in the live stock from the vitiated atmosphere in the public and private slaughter-houses and shops of the capital; our butchers not being able to give so long a price under such circumstances as they otherwise would were no deterioration experienced. This will appear manifest the moment both sides of the question are fairly examined. The butcher, like the farmer, for example, is a man of experience, being guided as to price by his former sales, so as to secure a fair per-centage of profit on his capital invested in trade. During the warm months of summer, tons of tainted meat are weekly sent to the knacker's caldron; besides what is returned to Newgate to be sold at a reduced price for sausages, &c. The loss here sustained is great, compelling butchers to be cautious buyers in the live-stock market at this season. Compared with winter, they are losers; but putting the cold and warm seasons together, experience enables them to obtain between the two a fair per-centage on capital. On the contrary, however, were sanitary improvement to prevent the deterioration and putrefaction of meat, and thus obviate the butcher's losses, he would share the advantages gained with the farmer by buying more freely, and at a higher price. From the competition of trade, and the familiarity of

live-stock salesmen with both sides of the question, the lion's share of the profit, thus gained, would go into the pocket of the farmer; while the public loss, if not entirely obviated, would be greatly mitigated at the same time.

In the second place, our readers would be benefited by the superior quality of the meat which they themselves consumed, whether it was slaughtered at home or purchased from the butcher. Many kill their own lamb and leg of mutton, and but for the difficulty of preserving it fresh until used, many more would follow their example. And even when they do not, they cannot be running to the butcher's shop daily; and how rarely is the "safe" or larder free from smell, especially in warm weather, so as to avoid inoculation and the deteriorating consequences which follow!

Nor is butchermeat the only article liable to putrefy, vitiating the atmosphere and inoculating other substances—cold dishes of every kind, fish, hams, produce of the dairy, poultry-yard, and garden, being so. In short, every animal and vegetable substance used for food is subject to decay, tainting the atmosphere with the gaseous matter given off in the process; but the miasm of animal substances is the most deleterious to animal life.

In the third place, if the atmosphere could by any means be kept rid of the putrid matter from butchermeat, and the other edibles noticed, it would greatly improve the sanitary state of both town and country. The amount of pestilential miasm daily given off from some butchers' shops and slaughter-houses during the heat of summer is incredible; and when we consider its poisonous action on the human system, especially in cases of sore throats and affections of the lungs, where it not only enters the circulation in the oxydation of the blood, but also by the absorbents of those vital parts exposed from broken skin, as also in the case of nervous debility, it is enough to infect the whole surrounding district, proving fatal to some, and sowing the seeds of lingering and painful diseases in others. We talk of towns being unhealthy from their confined atmosphere, *as a matter of course*; but a very little inquiry is sufficient to shew that this matter-of-course means nothing less than an unpardonable indifference to the purity of the atmosphere in which we live.

In opposition to this, it was frequently said before the Parliamentary Committees which sat on Smithfield, that the butchers are one of the healthiest classes in the capital; but a very superficial inquiry into the facts of the case soon shows that the conclusion is anything but legitimate and satisfactory. For example:—

Before the butcher's proposition can be admitted as true, it must be proved that he is constitutionally and industriously on a level with the other classes. Now, the fact is notorious that such is not the case; for, in the first place, it is a well-known fact that those who choose this profession instead of that which their fathers followed, or join it from without, are not the most delicate as to constitution; that butchers' families are not the most healthy; that no other class enjoy so much out-door exercise during the period of their apprenticeship—that period when the health of so many of the other classes generally gives way; that even when journeymen, and mostly confined in the shop, they have still more exercise to carry off the deleterious atmosphere they breathe, in the sensible and insensible perspiration, than the majority of other classes whose habits are sedentary and confined within close doors amid decaying substances, animal and vegetable; that butchers, as a class, are not so healthy as dairymen, who enjoy an equal amount of out-door exercise; that since the light-cart system commenced, the merchants' boys and journeymen who drive about through the streets of the capital from one side to the other are healthier than butchers; that a butcher's son who enjoys out-door exercise may be seen in the enjoyment of good health, while his daughter at the desk keeping the accounts is the very reverse, and that sons are as unhealthy as daughters when confined at the books; that the corpulence (obesity) and "big bellies" (dyspepsia) of which many of them boast as the indices of health, are the very reverse, being the surest proof of the most afflicting maladies that human flesh is heir to; and that had the daily diagnosis, so familiar to themselves and their wives, been faithfully laid before the Smithfield Committees, it would have confirmed this; that we have examined the majority of butchers' shops in the capital, and can certify, without fear of contradiction, by fact, that, as a class, they are far from being so healthy as they are represented to be. A liberal use of beefsteaks, beer, and exercise may, no doubt, in many cases, successfully counteract for a time the influence of putrid effluvia arising from shops and slaughter-houses; but daily experience proves, in every corner of the capital, that these form no infallible cure. On the contrary, the same daily guide proves the latter to be the source of much of that bad health under which the other classes suffer, and that butchers are not exceptions as to the purity of the atmosphere they breathe.

But, even granting, for the sake of argument, however absurd it may be in reality, that butchers can inhale with impunity a putrid atmosphere, and even get fat upon it! is that any reason why others should be called upon to breathe it, when experience proves it so injurious to their health? This is probably the best way of meeting the prejudices of the farmer as well as of the butcher, and therefore we give it. At all our hospitals disinfectant means are used. Why? The morbid anatomist, again, has long been familiar with the fact, that putrid subjects are dangerous ones, whether they are bipeds or quadrupeds. Why? If he scratches his finger with a putrid bone—amputation may be necessary; and, if neglected, the result is most assuredly death! Why? If he has a scratched finger, a similar result takes place if putrid flesh is allowed to come in contact with the broken skin! Why? In how many cases has a single inhalation of putrid air from animal matter proved fatal? With these facts every medical man has been familiar from time immemorial, so that to doubt the pestilential influence of the smell of butchermeat, bones, and offal when they begin to putrefy, is to ignore the voice of experience altogether.

We now come to the second part of our subject: The sanitary means to be used to improve, or rather to preserve in purity, the atmosphere of our slaughter-houses, larders, and butcher's shops. Many of our readers do not like newly-killed meat, and before it will keep long enough to please them, it must be slaughtered, cooled, and kept in a pure dry atmosphere—conditions by no means easily attained, for in the slaughter-house the farmer too often pays more attention to the manufacture of manure than the preserving of a pure atmosphere. In point of fact, the atmosphere of the slaughter-house is always tainted during the operation of slaughtering, and therefore requires to be purified afterwards. For this purpose—

The walls of the slaughter-house should be built of material, or covered inside, to the height of the shoulder or upwards, so as to permit of their being regularly washed every time slaughtering takes place: so should the floor. The roof should be ceiled, frequently white-washed, and brushed down every time before slaughtering. The object of the brush is to raise a fresh surface of lime for neutralizing foul air which may rise to it, and when no fresh surface can be raised, white-washed again. After the side-walls, doors, windows, &c., are washed, they should be dried with the mop, and then washed over with a solution of chloride of zinc, leaving this to dry. The floor, after being washed out, should be covered with a thin layer of powered lime by means of a sieve. If the regular slaughterman cleans out his house thus every evening when he drops work, not leaving a single article in it—offal and everything of the kind being removed—he will find it sweet in the morning, and free from inoculating smells; and so will the farmer and butcher, if they do so every time they slaughter. Some of them may, perhaps, think this speculation; but the time may not be far distant when it may become statute, at least in all our large towns.

The cooling or setting-room should be separate from the slaughter-house, the carcase being wheeled from the latter to it by means of a railway and travelling crane. It should be lofty, well ventilated, and as little water should be employed as possible in the keeping of it clean, when daily employed, for the sake of a dry atmosphere. For this purpose, the side-walls may be white-washed and regularly brushed down every time the carcases are removed, and only the doors, windows, and fixtures washed with a solution of chloride of zinc. The floors may be covered with lime as formerly.

The situation for both slaughter-house and setting-house should be airy and dry, exposed on all sides as much as possible to the influence of the sun and weather, and by no means under the shadow of trees, as they always pollute the atmosphere; but the heat of summer and frost of winter should be obviated by double walls, doors, windows, and roofs—a house within a house, as it were, so constructed as to create a current of air between the outer and inner one, thus carrying off the heat of the one and cold of the other, popularly speaking. In other words, there should be a considerable space between the ceiling and roof, the latter projecting over the walls sufficiently far to admit of their being covered by some sort of wooden awning or hoarding. This will be found far better than the shade of large trees, for either houses of this kind or dairies, larders, and the like.

As soon as the carcase is cool, it should be cut down, and either placed in the larder for use, or else consigned for sale, or removed to the shop, in the case of the butcher, so as to keep the setting-room sweet and free from smell. On no account should the slaughter-house be used as a setting-room, much less the setting-room for the larder, or the larder for a cook's shop; for the indiscriminate use of the one for the other in this manner would be sure to involve us in all the evils we seek to avoid. Some bailiffs and farmers may, no doubt, be apt to think that the setting-room may serve the purpose of a larder also, while the butcher may think his slaughter-house fit for a setting-room; but before attempting anything of this kind, they had better remember the truth of the old saying, "Prevention is better than cure:" for if once the atmosphere is tainted, and the walls and roof impregnated with putrid matter, in many cases it may be found better to pull down the butchers' slaughter-house and landlord's and tenant's setting-rooms, and erect new ones, than purify the old, the purpose of the one being so distinct from that of the other.

In the larder and butcher's shop, more water and chloride of zinc will be required than in the setting-room. Here everything should be kept clean by hot water and soap, putrefaction being counteracted by chloride of zinc; consequently, the walls and furniture should have a hard, glazed surface, and also the ceiling. This will, no doubt, incur a little more expense in the outset, but economy in the end.

Generally speaking, cooks and butchers pay more attention to outward appearances than to the great sanitary realities of their profession. Hence the scraping and washing of their tables and benches, &c.; while floors and walls impregnated to the heart with putrid matter are yet left untouched. Again, they prefer white marble slabs to black slate, although aware that the latter is superior for shelfing and every like purpose, in the larder, dairy, or butcher's shop.

All wood, before being used in butchers' shops, larders, and dairies, should be steeped in a solution of chloride of zinc—that used for doors, windows, flooring, and everything else—so as to prevent its absorbing putrid matter. If this is done, and if it is afterwards properly washed with a weak solution when required, it will remain sweet and clean. At present, the floor, door-posts, windows, blocks, &c., of many a butcher's shop in this great metropolis, are in a horrible state, barring all the soap, water, and scraping bestowed upon them; and we fear too many noble larders are, if possible, even in a worse state. When doors, &c., have not been steeped before being used by the carpenter, they should be well soaked with a concentrated solution when in a dry state.

Wood, and indeed everything else, should first be washed with hot water, well dried with a mop or cloth, and afterwards washed over with a solution of chloride

of zinc, using no more than merely to wet the surface properly, so as to avoid expense. Butchers at present use sawings of timber to cover their shop-floors; and were such soaked in the above solution, no better substitute, perhaps, could be suggested either for them or those of larders in large establishments, where there is a good deal of work.

During summer, and even winter, when the meat is intended to be kept for any length of time, a cloth moistened with a solution of chloride of zinc should be hung around it as soon as it is brought from the setting-room. The simplest way of effecting this is to hang one cloth behind, and another in front. In this manner, all the meat which a butcher keeps in his shop during warm weather could be placed on one side, and easily covered and protected. Such cloths might be of strong, open gauze or netting, so that the meat could be seen through them, and the front made after the fashion of curtains, for opening, either by drawing on a rod or winding up on a roller. Some chemists with whom we have been conversing on this subject suggest the wrapping of meat close in wet cloths, pointing to successful experiments thus made; but, from the few experiments we have made, we conclude that an open space should exist between the cloths and meat, and that in front this may be sufficiently wide to admit the ingress and egress of the butcher, in taking down and hanging up joints, when showing them to his customers, without the necessity of drawing the curtain: but arrangements of this kind may be varied a thousand ways, according to taste. The object being to keep off flies and extraneous smells, experience will soon teach him how this can best be effected in accordance with his convenience in serving his customers. The waste-tub, bones, and everything in the shape of offal, so liable to putefry and smell, should be kept closely covered over with a wet cloth; and this cloth might be thicker, and wet with a stronger solution, as offal of this kind is always a fruitful source of putrid matter. It is hardly possible to conceive the harm which stinking bits thrown into the waste-tub do at present, setting the whole shop literally on fire. Every morning, in warm, sultry weather, for example, whole stones are cut off and thrown into it; and when done, the joints from which such bits are taken appear "green and blue" before mid-day—strong enough to excite the dullest olfactory nerves in Whitechapel or Oxford-market, although offered at half-price. Long before the close of the day, the poor man may sigh heavily for colder weather, or even drown his cares in a pot of ale, not knowing whether to throw choice pieces, cut for special customers, into the "salt-tub" or "waste-tub," send them at once to the knacker's caldron, or entrust them to the mercies of another night, for a different class of customers, from the rapidity with which they are being consumed by the work of decomposition, kindled and accelerated by the putrid effluvia arising from this source, over which he has no control. But were he once to find that the simple means we thus suggest would obviate losses, quite a different line of policy would be followed in the commerce and preservation of meat on both sides; for then the maxim would be, "It is easier to keep out the enemy than to expel him after he has taken possession of the fortress."

In protecting carcases conveyed by railway, the hampers may either be lined inside with a cloth wet with a solution of the chloride of zinc, or the cloth in which they are wrapped may be thus moistened. The hampers should also be well steeped in a strong solution before being first used, and afterwards kept sweet and free from smell by the same means.

Wet cloths thus used would not only tend to prevent putrefaction, but also keep the meat cooler, which of itself is a good means of preservation. In Hindustan, and all tropical climates, wet cloths are universally used for keeping things cool, even when exposed to the heat of the sun.

Joints of cold meat may be preserved fresh, until used, by cheap gauze covers, kept wet with a solution of the chloride of zinc; and also dishes of every other kind.

Our readers are aware that chloride of zinc is largely used in all our hospitals, and that the solution of the salt we here recommend is a disinfectant fluid, famed in every quarter of the Globe. The price has been greatly reduced of late, there being now no longer any monopoly, but is still high (5s. per gallon): but for the wholesale purpose we now recommend, it can be had for 3s. 6d., ready money, delivered at any railway terminus or shop in the capital; and at this price every one who has a slaughter-house, larder, butcher's shop, or joint of cold meat, may use it, no less to his own advantage than that of the public. According to the old proverb, "Many littles make a muckle" ("Adde parum parvo, magnus acervus erit"); and if all the small smells in this great capital arising from putrid meat were obviated, its inhabitants would not have to breathe such a densely-polluted atmosphere.

IMPORTATION OF CATTLE INTO FRANCE AND ENGLAND.

During the first seven months of the years 1853, 1854, and 1855 the importation of cattle into France was as follows:

	1855.	1854.	1853.
Oxen	28,277 ..	17,421 ..	2,858
Cows	36,732 ..	28,003 ..	5,119
Calves	22,436 ..	19,134 ..	2,882
Sheep	133,248 ..	111,681 ..	53,107

It may be curious to compare these figures with those of the importation into England during the first seven months of 1855 and 1854:

	1855.	1854.
Oxen.....	20,420	20 273
Cows.....	2,465	9,792
Calves	11,693	13,594
Sheep and lambs	35,173	58,576

The first fact resulting from this comparison is, that the importation of cattle has much diminished in England during 1855, while in France it has considerably increased. The second fact is, that our (the French) importation has been much larger than that of England. This difference is easily explained by the difference of geographical position,

since we can easily get cattle by land, while for England they must be embarked: hence Holland and Jutland are about the only countries that continually export to England. However, we also export there, and that is another difference to be remarked between the two countries. Thus the official trade returns of England do not mention any exportation of cattle for slaughter; we, on the contrary, constantly export a great number of cattle to England, Belgium, Switzerland, and Spain. Our exports were, in 1854:—Oxen and bulls, 14,262; cows, 9,626; cows and heifers, 5,455; sheep and lambs, 51,455. So that our annual exports very nearly equal the importations of England. What are we to infer from these figures? They appear to us of the utmost importance in an economical point of view. France is the country of Europe best situated for trading in cattle as well as in corn. It is washed by both seas, and has the English market, the largest consumer in the world, at its disposal. Were our corn laws so framed as constantly to admit of the importation and exportation of corn without any fear of exceptional measures, a large trade would instantly spring up in our ports; and, aided by large capital, we should in a great measure be the providers of England. What is true for corn is not less evident as regards cattle.

LORD STANLEY ON LANDLORDS AND THEIR DUTIES.

We all of us know in what a multitude of good counsellors the English tenant-farmer rejoices. Everybody is ready to teach him his business, and to impress upon him his duty—to his country, his landlord, his labourers, and himself. This, in fact, is the common theme of almost all those occasions where the pursuits of agriculture can be with any propriety introduced. The fashion has become a very general one. The landlord, addressing him from the chair, dilates on what his tenant should do for the land; the clergyman, in turn, on what he should do for the poor; while the self-satisfied tradesman or learned theorist contrasts for his especial advantage what farming is with what it should be. As the pivot upon which all this turns we have been accustomed to look to the farmer to do all, as if there were no others whose very interests should prompt them to lend a helping hand.

In those autumnal gatherings just now commencing, it is satisfactory to find already some speakers willing to give a word to such other classes as may assemble round the dinner table of an agricultural association. We begin, indeed, as we should do, at the beginning. The land-owner in his office as President makes the conclusions to be drawn from his speech, matter of peculiar consideration for the land-owner. Without he does his duty, it will be impossible for the holder to enjoy a fair opportunity for doing his. Trite and true as this is, we still scarcely hear as much of it as might be expected. The fact, however, was well put by Lord Stanley, during the past week, at a meeting of the Manchester and Liverpool Agricultural Society; where, from his connection with the county, his lordship filled the duties of chairman. From what we may gather from the report, he appears to have done so with much ability and success. His own speech, touching on nearly every point which might be supposed to advance the cause of agriculture, only went to imply that we must advance yet further still:—"I think, gentlemen, I have made out my case, when I told you there was great room for improvement in the state of English farming. I go further, and tell you now that for such improvement there is an equal necessity. The value of agricultural produce in the United Kingdom, according to the estimate of the Statistical Society, from whom I obtained it lately, is about £215,000,000 yearly. We do not know—the best approximate calculation fails to tell us within any reasonable limit of accuracy—what the total private income of England is; but I believe it cannot much exceed, at the outside, from £400,000,000 to £450,000,000. If that is the case, as I believe it is—if the agricultural produce of this country supplies nearly one-half of our national wealth—I leave you to judge how vast would be the effect on both public and private property, if such a development of our agricultural resources as modern science has made possible were to take place."

There is, however, one difficulty in the way of thoroughly realizing this agreeable picture:—"We have intelligence, we have industry, we have wealth, we have public order, we have science. One requisite, and one thing only, is wanting to our greatness. Now, what is that weak point? I will tell you. It is narrow area and circumscribed territory. No nation, materially and morally so great, is territorially confined within such narrow limits. It appears that we cannot extend the national area; there are no unoccupied lands near us; colonization at home is impossible, and the days of conquest are gone by; and the only resource, therefore, that remains to us, if we cannot extend our territory, and if at the same time its smallness is the only limit of our power as a nation—is the principal limit of our power as a nation—is to do what is equivalent to extending our territory, by increasing the productive power of the soil within the same area."

Now the common-place way of obtaining this equivalent is palpable enough. Nine speakers out

of ten, when they got so far, would finish off very easily. We should "increase the productive power of the soil;" and then they turn on their attentive friend the tenant-farmer, and coolly tell him to do it. Increase the productive power of the soil; it is your business to do so—it is your duty to your country and yourself to do so. And down sits our common counsellor amply satisfied that he has done *his* duty. This is the "go-along" commander, who stood in the rear and told his men to go and take the fort. Lord Stanley, if we may judge him by what he says, belongs to another order. He sees that, in any such effort to increase the productive powers of the soil, quite as much depends upon the owner as on the holder of it:—"Now, what are the practical changes necessary to bring about that state of things? I do not mean all, but one or two upon which I have touched. There is one particularly which I would venture to lay down with all confidence. I think that land in this country ought to be easier and freer to buy and sell than it is. You may be told there are legal difficulties in the way. So there are, no doubt; but those legal difficulties are comparatively slight. It is not there the real obstacle, the real impediment, lies; it is a social difficulty, and not a legal difficulty. One could understand, one could excuse, one could sympathize with the feelings of a man who was reluctant to let go his hold upon any portion of the soil which he had once called his own; but, after all, the personal feelings of individuals must give way to the national necessity; and I do not hesitate to say that I feel conscientiously that any man—whether he knows it or not—is a wrongdoer as regards the community who retains in his own hands, or in his ownership, land which he has not the power to improve, and which he has the power to sell. The community has the right to say to every one, Either use your property profitably yourself, or let others use it for you. I am not now talking of a legal remedy; I do not want an Encumbered Estate Act for England—that is not necessary here, whatever it may be elsewhere; but I do want, and I do desire to see that every landlord should be an encumbered estate court in himself. Until that is done you will not place the tenure of land, you will not place the agriculture of this country on a sound and rational footing."

This, be it remembered, though delivered at a meeting of the Manchester and Liverpool Society, is the opinion of no mere Manchester man. If it were so, we confess we should hardly give it that prominence we do here. They are the words, on the other hand, of the representative of one of our old country families—of a nobleman whose inclinations or prejudices might be supposed to be especially identified with the retention of landed property. What is thus spoken only becomes the more to be depended on from this very reason. "Land ought to be easier and freer to buy and sell." Still at the same time we question whether his Lordship goes the most direct way to what he would obtain. The legal difficulty as it at present exists will, we fear, be found anything but a slight one. To hope for anything like a reasonable facility in the transfer of land, this must be the first obstacle to be attacked: the removal of the social one can only follow. How many landowners have we still who have neither the power to improve nor the power to sell? It would, in fact, be utterly fallacious to suppose that we could ever talk down any social feeling or habit in the face of a law that so directly encourages, or rather enforces, that we would condemn. We repeat, however, that we are inclined to think the best of what Lord Stanley says; but to complete his work he will have to say again and again, in his place in the House of Commons, what he has already offered to the Liverpool Agricultural Society on the tenure and use of landed property.

It is a landlord's duty he has here been telling us, and it is with landlords he will have still further to consider it. Let the tenure of land be so adjusted as to encourage instead of to retard its proper use and cultivation.

THE ENGLISH AGRICULTURAL SOCIETY IN CONNECTION WITH REAPING MACHINES.

The result of the recent trial of reaping machines at Abbot's Leigh, under the auspices of the Royal Agricultural Society of England, will doubtless be received by the public in various phases. It is certainly one of the most remarkable circumstances in connection with reaping machines, that during the five years in which the English Society has offered premiums for the best machine, in each year a different machine has been pronounced the one superior to all others competing. The first year of the two competing machines, M'Cormick and Hussey's, M'Cormick was found entitled to be classed first; in the second year Hussey's; in the third year Bell's, manufactured by Crosskill; the fourth year Hussey's, manufactured by Dray and Co.; in the fifth, the present year, M'Cormick, manufactured by Burgess and Key. It is true, that in the latter instance, a new principle has been introduced into M'Cormick's machine. Three Archimedian screws of tin-iron fixed on a wooden roller are so constructed as to deliver the cut grain at the side of the machine. The principle of a screw

delivery may appear to many an excellent idea. That the screw principle applied to the propelling of steam-ships has been eminently successful, admits of no question; but what is found applicable in so ductile an element as water, may prove quite inapplicable when applied to reaping-machines, requiring to deal with grain in various positions and of different degrees of resisting power. There can be little doubt in the minds of those conversant with machinery, that so long as the grain falls evenly upon the screw platform, the screw will deliver the grain without much impediment; but it is no less certain that the screws will cease to deliver when the cut grain falls in a ravelled condition, from some of the stalks of the grain falling sideways between the screws, and so choking the delivery. In a field of standing corn, and not over luxuriant, the machine may operate satisfactorily, as it appears to have done at Abbot's Leigh; but it is equally certain that in a heavy crop, partially lodged, the machine will come to a final pause, as it did at Trappes at the agricultural fête of the 14th ultimo. The trial at Abbot's Leigh is reported as to be "memorable in its immediate effects, and in the future results to which it will doubtless lead." The result most probably will follow that agriculturists will begin to understand that these public trials of agricultural machinery are little better than a farce, as they are at present conducted; and, however severely, impartially, or satisfactorily tested the machine may have been, in the opinions of those more directly in charge of determining the relative merits of different machines, that something more is requisite to produce decided and uniform results, and that a certain uniformity must be attained to, before the public can be expected to place confidence in decisions of this society, which, as regards reaping-machines, requires only new trials to upset. The truth is, the prizes at present are rather the result of a little dexterous management on the part of those in charge of the machines, than in the merits of the machines themselves. This appears to be thoroughly understood by machine-makers, who, in sending reaping-machines to Europe, select their foreman, or one equally qualified, to introduce the machine to the judges of the rival competitions.

In striking contrast to the decisions of the English Society are those of the Stirlingshire Agricultural Society, whose third year's competition is reported in to-day's paper. The first prize has been obtained by the same machine in each of those years, somewhat modified indeed, but in its essential principles the same. In 1853, the first prize was awarded to Bell's Reaper, and the second to M'Cormick's; in 1854, the first prize was awarded to Bell's Reaper; and the second to Dray's Hussey; and in 1855, these two machines stood in the same position—first, Bell's Reaper; second, Dray's Hussey.

In Crosskill's Reaper the details have been much improved since last year, the numerous failures then having pointed out the weakest parts, and those most liable to accident. The principal improvements in the working parts are—increased speed in the cutter, and a better construction of lever which works it, besides a better support to the lever; for, instead of working on an insecurely-fixed stud as before, it now works in a strong bush or carriage, and is consequently much less liable to derangement. The axles of the web rollers are strengthened by being made to pass through the whole length of the rollers, instead of being merely driven in a short way at each end. The gearing for working the rollers is also increased in strength and improved in arrangement.—North British Agriculturist.

COMMERCIAL ESTIMATE OF THE SEPARATE BREEDS OF SHEEP.

(FROM THE ROYAL AGRICULTURAL SOCIETY'S JOURNAL.)

It is worthy of notice that this is the first number of the *R. A. S. Journal* which has not been issued under the editorial revision of the deeply-lamented Philip Pusey, Esq.; and it appears that Mr. Thompson, Mr. Wren Hoskyns, and Mr. Dyke Acland have now the superintendence of this, one of the most important branches of the Royal Agricultural Society's very useful labour.

In quoting the prices, it must be understood that they are given at their *market value* in the manufacturing districts on the 1st of April, 1855:

LINCOLN.—This may be considered the standard of the coarse deep-grown wools for combing purposes, and the wool possesses a bright silky appearance of staple, which renders it peculiarly well adapted for "lustre" goods, in imitation of alpacas and mohair fabrics, and has thus enhanced its value of late years. The present value of Lincolnshire wethers' is about 12½d. per lb.; of hogs', 13d. per lb.

LEICESTER.—This old and much-valued breed for combing purposes is rather finer in hair than Lincolnshire wool, but does not possess generally so soft and silky a staple, and hence it is not at present so valuable where those qualities are requisite. The present value of Leicester wethers' is 12d. per lb.; hogs', 12½d. to 13d. per lb.

COTSWOLD.—A deep grown breed; the wool similar in quality to Leicester, of a deep and rather harsh character, not suitable for lustre goods. The present value of wethers' is 12d. per lb.; hogs', 12½d. to 13d. per lb.

ROMNEY MARSH.—Soft rich wool, finer in quality than the Leicester. It has been much exported to France, and seems well adapted to the use of the French manufactures. In Kent the lambs are generally shorn, therefore there are very few hogs. The present value of the Kent fleeces is about 13d. per lb.

DEVONS.—SOUTH HAMS.—A deep stapled breed of wool, grown in the county from which it derives its name. It is the custom of the farmers in Devon not to wash the sheep before shearing them, and the wool being thus in the yolk or grease, is not so marketable as other kinds, which are washed; it is, therefore, usually subjected to the process of combing before being sent to market, and comes in the form of "tops." A double advantage is accomplished by this; the wool is sent in a marketable form, and the noils and short wool, separated in the process of sorting and combing, are sold to the Devonshire manufacturers, who use them. If the wool were washed and shorn in the same way as in other districts, it would be readily saleable. Price about 9d. per lb. in the grease.

BAMBOROUGH.—Of the Leicester character, from the coast district of North Northumberland. A rich good combing wool, of tolerably fine quality; very much resembles the

Leicester, though with more lustre. The present value of wethers' is about 12½d. per lb.; hogs', 13½d. per lb.

BAMPTON.—A breed peculiar to Somerset and Devon; deep-grown, good average combing wool, of similar kind to the Leicester breed. The present value of hogs' is about 13d. per lb.; wethers', 12½d. per lb.

SOUTHDOWN.—Small haired wool; the tegs' and longer wethers' used for combing purposes, and the shorter for the manufacture of flannel and other light woollen goods. There is considerable difference in this wool, from the different localities, both as to quality and softness. The present value of ewes' and wethers' is 13d. to 13½d. per lb.; tegs', 13½d. to 14d. per lb.

HAMPSHIRE DOWN.—A short wool, very similar to Southdown in general character; staple rather longer, and hardly so fine. The present value of ewes' and wethers' is 13d. per lb.; tegs', 13½d. per lb.

NORFOLK DOWN.—The Down wool grown in Norfolk is generally soft in its nature, but unusually full of blue sand, which reduces its value. Some of the best and cleanest is very rich and beautiful wool. The present value of ewes' and wethers' is 12½d. per lb. of sandy, 13½d. per lb. of clean; tegs', 13½d. to 14d. per lb.

SHROPSHIRE DOWNS.—Generally longer in the staple, and with more lustre than the other Down wools. The fleeces vary considerably, according to the original proportion of short-woolled or long-woolled blood crossed with the breed. The present value of wethers', &c., is 13d. to 13½d. per lb.; tegs', 13½d. to 14d. per lb.

DORSET.—Rather longer in the staple and not quite so fine as the Downs, but for combing purposes quite as valuable; clean, white, soft wool. In this county the lambs are generally shorn. The present value of Dorset fleeces, 13d. per lb.; of lambs' wool, 16d. to 18d. per lb.

RYELAND.—An old breed, almost extinct, very fine and short; formerly used for clothing purposes. The present value about 13½d. per lb.

MERINO.—Some years ago there were many flocks of this breed kept in Hants and the adjoining counties; when fine wools were first used for combing purposes this wool realized very high prices; but after the introduction of Saxony and Australian wool for combing, these wools were to be bought much cheaper than the Merino, and it became little used. Merino wool generally came to market much heavier, and not so well washed, as Down wool. It was also much more wasty than Saxony or Australian. The present value, say wethers', 14d. per lb.; of hogs', 15d. per lb., but almost unknown in the market.

DARTMOOR.—From the Dartmoor Hills in Devon. Deep-grown combing wool, but coarser and not so well-bred as the South Down. Generally shown in the grease. Value in the grease about 9d. per lb.

EXMOOR.—A long-stapled wool of moderate quality; that produced by the polled sheep is usually heavier in the fleece, of a finer description. The present value of wethers' about 12d. per lb.; of hog's, 12½d.

RADNOR AND WELSH MOUNTAIN.—A moderate combing wool, somewhat coarse in quality and kempy. The present value of wethers', 12½d. per lb.; of teg's, 13½d. per lb.

CHEVIOTS.—This is a small-haired wool of medium length, suitable for worsted and woollen purposes. It is soft, rich wool, and is liked by the manufacturers. In those districts where the sheep are smeared the value of the wool is considerably reduced. The present value of ewes' and wethers', 12½d. to 13d. per lb.; of hogs', 13½d. to 14d. per lb.

BLACK-FACED HIGHLAND.—The kind of sheep kept upon the mountains and hills in the Highlands of Scotland; very coarse, and generally depreciated in value by the composition with which the sheep are heavily smeared; used for carpets, drugs, and low woollen purposes. The present value 8d. to 9d. per lb.

HERDWICK.—Peculiar to the mountainous districts of the counties of Westmoreland and Cumberland. The wool is used for making low woollen goods, rugs, &c. The present value about 8d. to 9d. per lb.

SHETLAND WOOL.—Small wool grown in the Shetland Isles, and used chiefly by the natives for clothing, and occasionally for hosiery purposes. The present value about 8d. to 9d. per lb.

CROSSES OF BREEDS.

LEICESTERS AND SOUTH DOWNS.—Generally grown in the Leicester district, and formerly much more valuable than Leicester wool. Since the introduction of cotton warps, reduced in comparative value. The present value of ewes' and wethers', 12½d.; of hogs', 13d. to 13½d. per lb.

LEICESTERS AND SHROPSHIRE DOWNS.—A breed of the Shropshire district; longer and more valuable than the Down; good combing wool. The present value of hogs' about 14d. per lb.; of wethers', 13d. per lb.

LEICESTER AND HIGHLAND.—From the Scotch district; suitable for low combing purposes, and more valuable than the pure Highland wool. The present value of ewes' and wethers', 9d. to 10d. per lb.; of hogs', 10d. to 11d. per lb.

LEICESTER AND BAMPTON.—A cross of two breeds, the wool of which is of very similar kind. The present value of hogs', 12½d. to 13d. per lb.; of wethers', 12d. to 12½d. per lb.

LEICESTER AND NORFOLK DOWN.—A very excellent wool, soft and rich; used for worsted purposes. The present value of ewes' and wethers', 12½d. per lb.; of hogs, 13½d. per lb.

COTSWOLD AND SOUTHDOWN.—A breed of the Cotswold district, suitable for worsted purposes; more valuable than the pure Cotswold breed. The present value of ewes' and wethers', 12½d. per lb.; of hogs' 13½d. per lb.

COTSWOLD AND HAMPSHIRE DOWN.—Same as Cotswold and South Down.

COTSWOLD AND SHROPSHIRE DOWN.—A breed of the Shropshire district, by which greater length is obtained than from the Shropshire Downs alone. Used for worsted purposes. The present value of ewes' and wethers', 12d. to 12½d. per lb.; of hogs', 13½d. per lb.

LINCOLN AND SOUTH DOWN.—A breed in Lincolnshire finer than the Lincoln wool and more valuable. Used for worsted purposes. The present value of ewes' and wethers', 12½d. to 13d. per lb.; of hogs', 13½d. to 14d. per lb.

LINCOLN AND EXMOOR.—The produce of two deep grown breeds, suitable for combing. The present value of hogs' about 12½d. per lb.; of wethers', 12d. per lb.

CHEVIOT AND SOUTHDOWN.—A breed in Scotland which produces a finer wool than the Cheviots; suitable for finer worsted and woollen fabrics. The present value of ewes' and wethers, 12½d. to 13½d. per lb.; of hogs', about 14d. per lb.

HIGHLAND AND SOUTH DOWN.—A good combing wool, longer in the staple than pure Down; suitable for clothing purposes. The present value 13d. to 14d. per lb.

DORSET AND SOUTH DOWN.—A breed of Dorsets; are of

equal length with the Dorset, and much finer; a soft rich wool, suitable for finer worsted purposes. The lambs are shorn in this district. The present value of Down and Dorset fleeces, 13d. to 13½d. per lb.; of lambs', about 18d. to 20d. per lb.

MERINO AND ROMNEY MARSH.—The fleece representing this cross-breed is a very beautiful one; an excellent combing fleece; fine, soft, clean, rich wool. When warps were made of worsted would have realized a very high value. The present value of hogs', about 15d. per lb.; of wethers', 14d. to 14½d. per lb.

JETHRO TULL'S "HUSBANDRY."

The labours of mankind, in all ages, have sufficiently established the truth that an art advances in proportion as its principles are understood by the minds engaged in it; and undoubtedly the backwardness of agricultural science, up to a very recent period, has arisen from a want of speculative inquiry among the cultivators of the soil. Our forefathers were shrewd, if not scientific: from the earliest times they found out the benefits of tillage, of manuring, of fallowing, of irrigating, paring and burning, alternating different species of crops, &c.; though the *reason* for all these processes lay hidden and untroubled with inquiry. Had there existed a succession of agricultural philosophers, to explain every new process and operation which practical men from time to time found to answer, how rapidly would other discoveries have followed up the first! because the experiments would have been made in a direction thus pointed out as the right, and accidental discoveries would have been improved, instead of overlooked, by men informed enough to appreciate their value.

Tillage, the fundamental operation of husbandry, has been practised in much the same manner in all ages and countries, and only of late years have we approximated to an explanation of its use. All the learned authors that ever speculated upon the origin of the practice of tilling the earth, have given, says the sagacious and sarcastic Tull, only this elucidation, "Tillage increases the product of the earth *because it does*. So that all the ancient *Scriptores de re rusticâ* have done was only to keep that theory in the same degree of perfection in which the first discoverers received it." And thus the whole practice of tillage has remained very imperfect, mainly because no reason could be found to show in what the true method ought to consist. No philosopher arose to deduce from the failures and successes of different modes of husbandry the nature of the principles which had been followed or violated: none arose to infer from the existing practices an "archetype" practice, or normal husbandry, to which all varieties of tillage ought to be gradually conformed. Yet until the principles of tillage be in some measure understood, and a standard be thus erected for guidance, our attempts at improvement must proceed with all the uncertainty of a haphazard in the dark.

The genius that first "broke ground," with permanent effect, in investigating the "Principles of Fertility, and its Increase by Tillage," was unquestionably that of JETHRO TULL; and there is good proof of his right to be considered the true father of agricultural science; for while other early explorers contributed partial theories destined only to meet with discomfiture in our day, he propounded and practically demonstrated views which are becoming more appreciated as the increasing light of science is thrown upon them; and be it remembered that this is not affirmed of some recent discoveries, but of such as were evolved, laboured upon, put in print, and strengthened by long controversy *nearly a century and a half ago*. The title of Tull's work, which appeared in the year 1733, is as follows:—"New Horse-hoeing Husbandry; or, an Essay on the Principles of Tillage and Vegetation: wherein is shown a method of introducing a sort of Vineyard Culture into the Corn Fields, in order to increase their Product, and diminish the Common Expense, by the use of Instruments described in Cuts."

Tull's biography is unavoidably short, all that seems known of his life being that he was born in Oxfordshire, was educated as a lawyer, and became a barrister; made the tour of Europe, particularly Italy and France; after which he settled on his paternal estate, which he cultivated with so much attention as brought on a disorder in his breast. After another visit to the continent, he fixed his residence on a hired farm near Shalbourne, in Berkshire. This farm, called "Prosperous," was situated, he tells us, "on an hill, that consists of chalk on one side, and heath-ground on the other, and was usually noted for the poorest and shallowest soil in the neighbourhood." It was here that he prosecuted his experiments, worn down by a painful and incurable disease, so that he speaks of "a time when my diseases permitted me to go into the wheat field;" and again, "when my illness prevented my attendance in the field at the time of reaping;" and instead of meeting with encouragement and applause, he was subjected to the attacks of an anonymous society, which both pilfered his discoveries and treated him with calumny and derision. "It is said," he writes in a memorandum to his last publication, "that mine is the first book on agriculture that has happened *to be pirated*; and that upon the

first notice of it I ought to have desisted, because I could have little obligation to a country whose laws did not protect me in the property of my labour, and of my expense that is joined with it. The best apology I can make is, that it is natural for the true parent rather to lose the property of his offspring, than not to endeavour to preserve the life and well-being of it, though in the hands of enemies." Added to his bodily infirmity, were also the vexatious and often wilful blunders of his workmen in conducting his new and refined field operations, who, when blamed for violating his directions, "magisterially answered according to their own theory, which servants judge ought to be followed before that of him they call master;" and who would plough a shallow instead of deep furrow, "pretending they will plow it deeper the next time, which these rogues know very well cannot be done, and intend no more than that the plough coming the easier after the horses, their coats may shine the better; and though there be no crop at harvest, they must have four meals a-day all the year, and extravagant wages at Michaelmas, or at any time of the year when they think fit to misbehave themselves." His neighbours, too, appear to have been in no way able (even if willing) to assist in his plans: he had improved some wet land by a peculiar sort of drainage, "yet very few farmers will alter their old method—no, not even to try the experiment; but still complain their ground is so wet that it brings them no profit:" and of some who, making the attempt, only failed through mismanagement, he adds, "they will doubtless find their mistake, and amend it, having a precedent before their eyes; but if they had none within their own inspection, I question whether this mismanagement might not discourage them from prosecuting their project any further." And as further illustrating their calibre and spirit, we may add a remark from Tull's Preface—"The sowing of artificial grasses was so long before it became common amongst farmers, that though Mr. Blythe wrote of it in Cromwell's time, yet thirty years ago, when any farmer in the country where I live was advised to sow clover, he was certain to say, '*Gentlemen* might sow it if they pleased; but they (the farmers) *must take care to pay their rent*,' as if the sowing of clover would disable them from paying it; and now the case is so much altered, that they cannot pretend to pay their rent without sowing it, though the profit of it is vastly less since it has become common than before; and the improvement, after all, was no more than doing the same thing on this side of the water that was done before on the other (viz., on the continent)." Another of his misfortunes arose from the discredit brought on his system by rash and ignorant imitators and expounders. When his Horse-hoeing and Drilling began to create some stir in the world, numerous pretending bailiffs undertook to develop its mysteries upon the estates of curious or patriotic noblemen; "but," writes Tull, "gentlemen are liable to be imposed on by them,.... for amongst all those who have undertaken the management of my scheme, I declare I do not know one person that sufficiently understands it: there may be some who have seen, or perhaps performed some of the mechanical part; *but I don't think it can be properly performed without a thorough knowledge of the principles*, which cannot be expected of such illiterate persons; and yet is necessary for the proper applications in different cases, which cannot be distinguished by pretenders..... Before any one makes his trials of my field-scheme, I would advise him to be master of the treatise."

His first edition of the "Horse-hoeing Husbandry" was published in the year 1731; followed by the "New Horse-hoeing Husbandry," more extended than the former, in 1733; and lastly came "A Supplement to the New Horse-hoeing Husbandry," in 1739—each edition being garnished and fortified with voluminous "Notes." A translation was simultaneously undertaken in France by three persons of consideration without the privity of each other. It was brought out by *Du Hamel du Monceau*, of the Royal Academy of Science. The fourth English edition was published in 1762, and a subsequent one appeared with an Introduction by Cobbett. Tull died in 1740. Such is the brief memoir, chiefly gleaned from the scattered personal references in his work; but the reader who carefully peruses all the minute details of his experiments and his infinitude of directions, both for constructing and working his machines, may readily picture to himself the homely nature of his daily pursuits; the unflagging good humour that animated him through a variety of tasks and trials; the perseverance and undaunted love and zeal for the science, which he perceived beneath the mould of his fields—all characterising this extraordinary man.

As a scholar he had made himself familiar with the bucolic literature of classic times and countries; the evidence of which appears in his criticisms of the ancient authors: and he seems also to have read and studied such works of the learned men of his own day as treated of cultivation and vegetable growth—of which class were Dr. Woodward's "Essay towards a Natural History of the Earth," published in 1695; followed by Evelyn's "Terra;" and also Bradley's "Philosophical Treatise of Husbandry and Gardening," and other works.

As a specimen of ingenuity and originality of thought, groping in the utter darkness of mere guess-work and speculation, before the very dawn of chemical and geological science, and to exemplify the sort of aid which Jethro Tull could obtain from

contemporaneous literature, we give the following passage, selected by Mr. Hoskyns from Evelyn: "Those who have written *de arte combinatoriâ* reckon up no fewer than *one hundred and seventy-nine millions one thousand and sixty* different sorts of earths [an extravagance which Tull, in one chapter, hardly takes for granted upon the authority of the learned, or yet sees his way clearly to deny, but provides a creep-hole for doubting in the shape of an "if"]; but of all this enormous number, as of all other good things, it seems they do not acquaint us with above eight or nine eminently useful to our purpose; and truly I can hardly yet arrive at so many. Such as I find naturally and usually *to rise from the pit*, I shall here spread before you [the Council of the Royal Society] in their order. The most beneficial sort of mould or earth, appearing on the surface, is the natural under-turf earth; but for a description of the rest which succeed it in strata or layers, till we arrive at the barren and impenetrable rock, I shall refer the critical reader to the *old Geoponic authors*..... My Lord Bacon directs to the observation of the rainbow, where its extremity seems to rest, *as pointing to a more roscid and fertile mould;* but this, I conceive, may be very fallacious, *it having two horns or bases which are ever opposite*." Tull was acquainted with the botanical discoveries of Malpighi, and had informed himself of all that was then known of the physiology of vegetation by means of Grew's "Anatomy of Plants" and the records of experiments by Van Helmont and others. But how could all this, which was then very considerable learning, help him to a true theory of the food of plants, and the influence of atmospheric agencies upon the soil, when as yet Linnæus, Darwin, Decandolle, Mirbel, De Saussure, Knight, and others, had not arisen to lay bare the secrets of vegetable life; before Scheele, Priestley, and Lavoisier had analyzed the air into its two elements —oxygen and nitrogen—and revealed in it the presence and constitution of carbonic-acid gas; before Davy, Berzelius, Liebig, and Boussingault had obtained their wondrous insight into the composition and combinations of external nature? We shall see how his original mind wrought out and laid hold of his grand principles; which are in the main true, although he could not attach *the right names* to the powers and processes he perceived at work, and remained ignorant of many agents and ingredients now disclosed.

During his travels abroad (particularly in Languedoc, where he lived some years), he was struck with the field-culture of the vine, and noticed that the "low vineyards" were planted in such a regular order that they could be constantly ploughed in all directions, and the soil thus kept pulverized between the rows. He observed that the ground was never manured—the reason for this being that the usual management was to keep the vines low, and treat them much as a plantation of raspberries or currants is in England; and having their heads just above the ground, experience had taught that, in a hot climate, the application of dung would spoil the taste of the wine they produced. He saw land of indifferent quality producing an annual crop of grapes and wood without any manuring, and without a summer fallow; for the vines lived in it "and all over it all the year." Yet a few successive crops of wheat, without either of these applications for maintaining fertility, would impoverish the soil. What was the explanation? Why, he learned that unless the ground were repeatedly and deeply stirred and pulverized either by the plough or the "bidens" (a double-toothed hoe) the vines yielded nothing of any value; but, on the other hand, though there was annually carried off from an acre of vineyard as much in substance as is carried off in the crop of an acre of corn produced on land of equal goodness, the vineyard soil was never impoverished unless the hoeing culture were denied it. The conclusion was irresistible, that the exhaustion of the soil was supplied by no other artificial help but hoeing, or continual tillage, while the crop was growing. Travellers had wondered at all this before; but it was reserved for Tull's reflective energy first to generalize and apply the fact to its right use in the culture of other crops, and then further to investigate the causes of so singular a phenomenon. In order to adopt the method with wheat, the old random husbandry of broad-cast sowing must be abandoned, and the crop be planted in rows sufficiently wide apart to admit of the horse implements passing between them. Hence, he gradually approached to his renowned "Drill Husbandry." But then came misgivings; such as, whether an increased weight and bulk in each row would compensate for the great space of ground left unoccupied. This was a matter for trial; and Tull applied all his strength and perseverance to test and prove the new method.

Another misgiving arose in Tull's mind as to the worth of his new idea: if it were really a valuable discovery, and might be profitably acted upon, why was it left for an English gentleman to perceive and appropriate, when all the eager cultivators of Rome, Italy, and France had for ages left it unheeded?

The ancients were perfect masters of the vine husbandry; and, perhaps, as he suggests in Chapter XI., this may have so engrossed their rural studies, "that it did not allow them so much reflection as to apply the use of those methods to the increase of bread, which they had discovered to be most beneficial to the increase of wine." So convinced were they of the fructifying power of mere tillage, that, according to Columella, they hoed the vines after

blossoming, in order to fill the fruit—precisely the practice recommended by Tull, in wheat culture, to fill the ear. Palladius mentions even the "sarrition" or "sarculation" of beans, which scratching operation being performed twice in the month of January, the beans will produce much corn, "and so large as to fill the bushel almost as full when shal'd as unshal'd." But if we translate *sarritio* "hoeing," we shall give an idea very different from the true one. It appears in Columella that there were two sorts of harrowing—*occatio* and *sarritio*—both effected with much the same sort of instrument, but differing in the time; the first being at seed-time, to cover the seed or level the ground; the other to move the ground after the plants were up. They sowed their corn under furrow; that is, when they had harrowed the land to break the clods, they scattered the seed, and then ploughed it in. This leaving the surface very uneven, the corn came up most thickly in the low creases between the furrows; so that they then used either *plana sarritio*, by harrowing lengthways of the furrows, which being somewhat hardened, there would be little earth thrown down upon the young plants; or else another sort of sarrition, by which the corn is said *adobrui*—to be covered, which seems to have been performed by harrowing across the furrows. The object of this harrowing or raking was simply in order that the weeds might be more easily eradicated; but it is a question whether the good it did in facilitating the "runcation" (or hand-weeding) was greater than the injury it inflicted by bruising and tearing the corn. Many of the ancient husbandmen certainly omitted all sarrition of their corn; their only operation at all resembling hoeing was sarculation, performed amongst small quantities of irregularly sown corn by means of a *sarculum*, a sort of narrow hand-hoe or pick. But this was too tedious and chargeable a process to be applied to large breadths of corn, which was all sown broadcast; and, indeed, the want of hands to accomplish such a slow labour may have been one reason why they were unable to introduce it into the fields to any purpose, though they could not have been ignorant of its effects, from the example of their vineyards and gardens. But they never planted their corn *in rows*, without which they could not give it the vineyard hoeing, by tilling between them either with the plough or with their deeply-stirring bidens. The principal reason seems to be that they had not discovered the chief use of such culture, namely, to furnish new nourishment by dividing the earth, as may be inferred from Virgil's expressed opinion of the lupine's having no need of sarrition, because *it is able of itself to kill weeds*. "And the belief of that blind doctrine—the equivocal generation of weeds without their proper seeds," Tull says, in Chapter VII. (*Of* Turnips), "may probably be one of the causes that made the ancients despair of finding success in hoeing; or else, if they had had *true principles*, they might perhaps have invented and improved that husbandry, and the instruments necessary to put it in practice." Here, then, we have a striking illustration of the value of a correct theory in agriculture; without which, mere accidental successes and the suggestions of analogy are insufficient to lead us in the path of improvement.

Had Tull contented himself with inventing his drills and ingenious tillage implements, and with utmost pains proving in the field what were the best methods of management for every sort of crop, according to his system, his unbounded researches after mechanical ideas suited to his purpose, and his series of wonderful labours in perfecting his exuberant contrivances, would have gained him a lasting renown; but when we add to these his profound and elaborate investigations into the theory of the soil and of plants, and the inexhaustible fund of original illustrations which he has employed to elucidate his doctrines, we cannot refrain from venerating him as an agricultural Newton. Yet his was the sad life of too many great explorers and enunciators of natural truth; and even the lesson coming to us from the fact of all our present cultivation being dependent upon means which he originated, only to meet with obloquy and ingratitude, will not save future discoverers from a similar fate.

The inquiry which Tull determined to solve was, *How* are plants profited by the stirring of the soil around their roots? Plants were nourished by means of their roots: of that there was no doubt. When examined through the microscope (which instrument Tull himself was accustomed to use), the small capillary fibres were ascertained to have mouths opening on their outer spongy superficies, just as animal intestines have lacteal vessels opening in their inner superficies; and as the animal vessels take in their food by being pressed into contact with the mass from which they absorb it, so it was reasonable to suppose that the "lacteal mouths of roots" must be pressed against the soil outside, by means of the roots' increase in diameter and length in the earth, and by the gentler pressure of water. Then he had many practical evidences of the fact, such as that plants would not live unless water was supplied to their roots; they prospered according to the fitness and quality of the soil in which they were set; and, again, sent out minute rootlets in such profusion as could not be necessary for the mere support and steadying of the plant or tree, and must therefore be supposed to be seeking food.

In the opening chapter, "*Of* Roots *and* Leaves," he begins, where an agricultural student ought to begin, with instituting inquiries and experiments upon those organs of nourishment which it will be his

business to feed. He ascertained the great length of the invisible fibres of roots, and that they drew their nourishment from a much further distance than was commonly supposed. His proof was that they would thrive from the influence of digging performed at several feet distance from them. He noticed that the ploughing and hoeing of a piece of ground had affected the growth of a contiguous plot of turnips; and in such a manner that the outside row swelled to the greatest size, the next rather less, and after three or four rows the rest of the bulbs remained all alike diminutive. But what was more observable, was, that opposite to one place where a portion of the ground had been missed by the implement, and continued hard, no such effect was visible in the adjacent turnips. From this circumstance he deduced a method for testing the length of roots, namely, by setting a number of plants (say turnips) along the middle of a plot of trapezium shape, which is to be regularly tilled. If the turnips attain to larger size, according to the width of the cultivated bed, it will show that their roots extend to the outside edge; and where the bed begins to increase in breadth without influencing the size of the turnips, there the width of the ground will measure the maximum length of their roots. He found that though minute roots could not penetrate far in hard ground, yet when this was mechanically loosened and opened they would run in any direction, and to an astonishing distance, to wherever a tilled bed of earth or a store of manure was provided. Cotemporaneously with observations upon field vegetables and orchard trees, he instituted a variety of experiments with plants of mint. He would have some with their roots in glasses, supplying them with different liquors; sometimes a single root in one liquor, and the remaining roots of the same plant in another; sometimes have part of the roots in water, and part in dry soil; and from these trials in glasses and boxes, and from inspections "by the help of a coarse microscope," he arrived at the following, together with several other results:—"When new earth is applied to the old roots, a plant sends out new roots on purpose to feed on it; and the more earth is given it, the more roots will be formed. This corresponds with the action of hoeing; for every time the earth is moved about roots, they have a change of earth which is new to them. Roots by being broken off near the ends increase their number, and send out several where one is broken off. They increase their fibres every time the earth is stirred about them. The stirring of the earth makes the plants grow the faster." Was it not truly philosophical for a farmer thus to seek to comprehend the *rationale* of his exercises in the field?

The functions of leaves he took to be to eliminate and discharge into the atmosphere such matters in the sap as were unsuited to nutrition, and to purify it somewhat as the lungs of an animal depurate its blood; and this he gathered from Dr. Grew's description of the "net-work, cobweb, skeins of silk, &c., and the multitude of air-bladders, which I take to be of the same use in leaves as the vesiculæ are in lungs." And he knew of experiments which had shown that air passes in at the leaves, and that the plants would die if their leaves were deprived of it. The practical use he makes of this idea is to place sufficient intervals between growing plants, that the air may not stagnate among them, and weaken them "as an animal is when his lungs are forced to take back their own expirations, if debarred from a sufficient supply of fresh untainted air."

Thus he has concluded that plants require *plenty of room*—above-ground to breathe, and below the surface to spread more roots for food; and tillage or hoeing both facilitates their search and stimulates their appetite for nourishment. Only open a way to the store, and the plant sends forth innumerable messengers to seize it.

On what kind of aliment, then, do plants subsist? "The chief art of the husbandman is to feed plants to the best advantage; but how shall he do that, unless he knows what is their food?" Therefore he devotes Chapter II. to the "FOOD *of* PLANTS." The material substances which indisputably contributed, in some manner, to the increase of plants he sums up as being—"1, *nitre*; 2, water; 3, air; 4, fire; 5, earth." Can any one of these be pre-eminently *the food* of which they partake? It was a prevailing opinion in the seventeenth century, and was embraced by several naturalists of the eighteenth, that WATER is that sole food. The experiment of Van Helmont they thought to be conclusive on the point. Having dried 200lbs. weight of soil, he planted in it a willow of 5lbs. weight, watered it with rain or distilled water; and after five years again weighed the tree, which, with all the leaves it had borne during the time, equalled 169lbs. 3 oz., while the soil had lost only 2 oz. of its original weight. But Dr. Woodward confuted the notion that the increased weight of the willow was necessarily due to the water it had absorbed, by showing that this liquid has always in the minute intervals between its particles a charge of *earth*, from which no art could free it; and as the 200lbs. of earth was not augmented by this addition, this earth in suspension must have entered the tree. Tull believed, therefore, that water was only *the vehicle* for conveying the real food into the roots of a plant. Bradley had contended that AIR was the food of plants, being principally carried into the roots in the water they imbibe; but Tull says, if this were the case, the plant could have no greater specific gravity than the atmosphere of which it was composed. The

weight of a vegetable must consist of earth and water. The air being a homogeneous fluid, must be unable to supply such different substances as are found in vegetation. And, besides, what becomes of the fact that the *quality of a soil* affects the character of its produce, and that a change of the sort of crop follows beneficially on the same land? In later times it has been ascertained that plants are not simply fed, but derive a very large portion of their substance from the atmosphere by the absorptive action of their *leaves* — the carbon which they inhale and separate from its union with oxygen, in the form of carbonic-acid gas, combining with other elements to constitute the solid matter of their tissues. However, Tull was quite right in as far as he is affirming that air is not the food obtained by *roots*; but he had, likewise, a partial view of the above operation of the leaves. We have already seen how he regards them as lungs to discharge the vegetable recrements; and in Chapter I. he adds—"besides which use, the *nitro-aërous* particles may there enter, to keep up the *vital ferment or flame*," by which he evidently intends an *oxygenization* of the sap analogous to that of the blood in animals. And in Chapter XI. he urges the importance of a plentiful supply of atmospheric air to every portion of a plant above ground, so that it "may communicate its *nitre* [for which we must read *oxygen*] to the lower as well as upper leaves, and carry off the recrements they emit." This theory was *practically* true, although it is a *wrong agent* which his supposition solely employs in the process.

This NITRE is one of the substances which at that time were commonly agreed to minister to the necessities of vegetation, and oxygen is obviously signified by the term; for he says—"I will not mention, as a food, that *acid* spirit of the 'air' so much talked of [apparently, therefore, a newly-discovered or surmised element]; since, by its eating asunder *iron bars* [in the process of "rusting"], it appears too much of the nature of *aqua fortis* to be a welcome guest alone to the tender vessels of the roots of plants. Nitre is useful to *divide and prepare* the food, and may be said to nourish vegetables in the same manner as my knife nourishes me, by cutting and dividing my meat; but when nitre is applied to the root of a plant, it will kill it as certainly as a knife misapplied will kill a man." Here, again, Tull's intuitive insight or unexampled powers of perception made him master of a theory which was practically true, inasmuch as subsequent discoveries have proved that the soil is acted upon in this manner in the process of its aeration, though the precise agents he could not correctly point out. FIRE—another of the elements in question—cannot be the food of plants; but a certain degree of it, which we call heat, he found to be indispensable to maintain their growth. Lastly, he comes to the consideration of EARTH as the proper pabulum on which roots feed.

The doctrine asserted by Tull over and over again, that *plants feed upon fine particles of earth*, has been repudiated and ridiculed by chemists and philosophers up to this hour; and even many who now view with approval the practice which he deduced from that theory, and who have helped in establishing both the fact and reason of the manurial effect of mechanical tillage, still continue to regard the theory itself as absurd and inconsistent with the facts of modern chemistry. However, among the disciples of Jethro Tull (increasing in number, we believe, every day), one, who is pre-eminently the great commentator and practical expounder of his teaching, has arisen to enunciate and justify his principles—we mean the Rev. S. Smith, of Lois Weedon, in Northamptonshire; who from zeal for the system of the great agricultural master has carried it out with all the aids which the present state of rural science and mechanism could supply to his skilful and judicious hand, and who from motives of public benevolence has been induced to publish his successes for the encouragement of all engaged in the work of cultivation. In an article on "Tull," in "Morton's Cyclopædia of Agriculture" (published by Blackie), Mr. Smith shows that instead of mere particles of sand, clay, &c., being signified by Tull under the term "earth," there is scarcely a conceivable expression which is not used in the "Horse-hoeing Husbandry" to explain and illustrate a deeper and far-sighted meaning. Tull knew that the soil did not consist of homogeneous matter; and when he uses the term "earth"—lest he should be supposed to imply that plants lived upon anything and everything they might find in it—he proceeds to describe those particular matters (helping by their presence to compose its mass, and so being a portion of what in the gross is commonly designated "the earth") which plants singled out for their own use. Let us endeavour to fix what his views of this earth-comprised pabulum really were. As he could not actually see a plant eat, as he could an animal, he had recourse (like a modern chemist) to *analysis* of the constituent materials of the plant. Whether we burn a plant, or cause it fully to decay, the result will be that we shall have a residuum of earthy matter; which in the former case we should call ash, but which will really be of the same composition as the earth left after decay, only somewhat changed by the action of heat. This quantity of earthy matter consists of various mineral substances such as exist in the soil, and were undoubtedly abstracted from the soil and conveyed into the roots of the plant in

combination with other food. Tull was right, therefore, when he maintained that, if the matter remaining after the corruption or putrefaction of a tree be earth, it will be a proof that earth was taken in and retained by it for its augmentation: "According," says he, "to Aristotle's doctrine, 'putrefaction resolves it again into earth, its first principle.'" He seems to have supposed that by this process the watery juices, and perhaps any gaseous matter in the vegetable, were dispelled into the air, and that the little earth which remained formed the entire solid portion of the various fibres and vessels. "Every plant is earth, and the growth and true increase of a plant is the addition of more earth." And in Chapter XIV. he says—"The food of most animals is earth, very variously changed and modified by vegetable and animal vessels." All that he obtained by such a rude mode of analyzing was the mineral portion of the plant, which had originally entered it as "inorganic" food. But a proportion of the plant's solid matter many times greater than this was in reality dispelled into the atmosphere from which it had been at first derived; in fact, the chief part of the substance passed away in the form of gases, which had either been collected by the leaves or had been received in solution by the roots in combination with other food. This "organic" food, which the roots chiefly require, was not discovered, therefore, by Tull's analysis. By his system of constant pulverizings, this gaseous matter—of which all organic structures are chiefly composed—was abundantly supplied to the roots of his crops at the same time that the mineral food was thus prepared, because air and rain-water containing it were thereby introduced into every pore of the soil. But it will be scarcely accurate to say that because the great apostle of tillage did not know that these particular elements were being furnished by his process, therefore he looked only to the supplying of the inorganic or earth-food of plants. Mr. Hoskyns, in his "History of Agriculture," hardly goes far enough, we think, when he interprets Tull's discovery to be this—"*That if supplied with their inorganic elements by the soil,* plants have the faculty of obtaining the material of their organic structure from another source." For, in accounting for the preparation and replenishing of food in the soil, we find that Tull describes phenomena which answer only to the changes which the organic portion of the pabulum passes through. Indeed, Mr. Smith concludes—from the many original and extraordinary illustrations of Tull's meaning scattered through his work, and only to be found by the most diligent fishing among irrelevant sections and redundant notes—that the fine particles of earth are the "*organic food, the only food he acknowledged or thought of for the plant..... For the supply of the mineral or inorganic ingredients Tull made no provision whatever.*" Now as it is certain that Tull's doctrine, however understood in the light of modern science, led him to act upon this truth—*the soil may be made to furnish all the conditions of vegetable growth* (of course with due warmth and moisture) *without the direct application to the roots of vegetable matter* (*or manure*) *through that medium;* it *practically* matters little which out of the two classes of nutriment he may have regarded as the sole food, and which he may have ignored, simply from not knowing that such a distinction would ever exist. But if it can be shown that he really taught the existence of *both*—if it can be shown that his words describe more than some fanciful operations of nature, which parallel or image certain processes with which we have become subsequently acquainted—that they disclose a theory not merely bearing a resemblance to half of the now ascertained facts, but presenting a view of the entire truth—namely, that of the two orders of vegetable nutriment as now known to us—as clearly as it was possible for language to do before the objects testified of had been yet revealed otherwise than to conjectural philosophers, and had therefore no established name or even rumoured existence; if this can be shown, we shall obtain a profounder view of the genius and imagination which could probe so deeply into mysteries only in our day developed by inductive science, and build upon the comparatively scanty data of his own observations a theory anticipating the hypothesis of the nineteenth century; and possibly we shall further see in such a remarkable example a testimony to the power of a great and complete truth in natural science to guide its possessor unerringly in practical applications to the purposes of life.

It is said that, in reading Tull, the student discovers (as in works of a different order of genius) new wonders at every fresh perusal; and thus it may be that the view we take of Tull's doctrine is only a later outshine than has yet flashed forth from his quaint pages. Let us now extract the meaning of the principal passages expressing his views. In Chapter III., he says the particles which are the pabulum of plants are so fine, minute, and light, that it is not unlikely that roots "may insume no grosser particles than those on which the colours of bodies depend.... My microscope, indeed, is but a very ordinary one; and when I view with it the liquor newly imbibed by a fibrous root of a mint, it seems more limpid than the clearest common water, nothing at all appearing in it." Atoms so imponderous, incapable of being "singly attracted to the earth," he considers could not continue isolated and independent in the soil, but "would

fly away at the first pores that were open"; unless water always saturated the ground, and so held them in suspension. Therefore, instead of having "intire superficies of their own, they want some part of it which adheres to or is part of the superficies of larger particles, before they are separated by roots." These atoms of pabulum adhere by the attraction of cohesion to larger particles of earth "with which they are in contact (like dust to a looking-glass—turn it upwards or downwards, it will remain affixed to it), as these particles do to those parts, until from thence removed by some agent." The aggregate surface of these supporting particles of earth—or, as he denominates it, "the earth's *internal superficies*," to distinguish it from that on which we tread—being the place or situation where plants find, and from off which they take their atomic food, is what Tull calls by the remarkable expression, "the pasture of plants." Tillage by dividing the soil into more parts increases the quantity of this superficies, surrounding every pore and interstice, and so adds to the extent of the plant's subterranean pasture or feeding-ground; and this pasture is supplied with pabulum by the influence of the atmosphere, which tillage helps to introduce in the same proportion as it exposes new surface to be so acted upon. While farmers had universally regarded tillage as a strictly mechanical process, making the growth of roots easier and eradicating weeds which would interfere with their crop, Tull had discerned the *fertilizing* power it possessed; and this theory was the only one by which he could account for such effects, from an *à priori* consideration of the mystery. "The pasture of cattle has been known and understood in all ages of the world, it being liable to inspection; but the pasture of plants, being out of the observation of the senses, is only to be known by the disquisitions of reason, and has (for aught I can find) passed undiscovered by the writers of husbandry. When they, in discoursing of earth and vegetation, come nearest to the thing (that is, the pasture of plants), they are lost in the shadow of it, and wander in a wilderness of obscure expressions—such as *magnetism, virtue, power, specific quality, certain quality,* and the like—wherein there is no manner of light for discovering the real substances; but we are left by them more in the dark to find it than roots are when they feed on it; and when a man no less sagacious than Mr. Evelyn has traced it through all the mazes of the *occult qualities*, and even up to the *metaphysics*, he declares he cannot determine whether the thing he pursues be *corporeal* or *spiritual*." And the ignorance of whence plants take their food "seems to be one principal cause that agriculture, the most necessary of all arts, has been treated of by authors more superficially than any other art whatever."

Next, then, what *à posteriori* confirmation of his new theory could be found? There was the fact that when no vegetables are suffered to grow in a soil it will always become richer. In Chapter III. (*Of* PASTURE OF PLANTS) he says—"Plough it, harrow it, as often as you please; expose it to the sun in horse-paths all the summer, and to the frost of winter; let it be covered by water at the bottom of ponds and ditches; or *if you grind dry earth to powder, the longer 'tis kept exposed,* or treated by these or any other method possible (except actual burning by fire), *instead of losing, it will gain the more fertility*."

In Chapter V. (*Of* TILLAGE) he states, from actual and frequent observation, that "the finer land is made by tillage the richer will it become, and the more plants it will maintain."

He quotes the testimony of Evelyn, that the most barren earth may be made amazingly fertile simply by being ground or pounded, and exposed with incessant agitation for a year; that such artificial dust has more nutritive power than any artificial dungs or composts; and that by means of simple pulverizing "'tis found that soil may be so strangely altered from its former nature as to render the harsh and most uncivil clay obsequious to the husbandman, and to bring forth roots and plants which otherwise require the lightest and hollowest mould." It was evident, then, to Tull that tillage not merely provided passage for the influx of the pabulum of plants, and space to receive and retain it, but that it was also the means of communicating this food to the soil; in other words, that it not only subdivided the ground into smaller particles, but also caused the accumulation of the atoms of pabulum upon the superficies of those particles. Whence were these atoms derived, and how did tillage secure their presence? Now, we are of opinion that Tull's language describes (as he intended) not one kind, but *two distinct kinds* of food for vegetation, supplied from entirely different sources.

We think we can show that Tull really describes both the organic and inorganic foods of plants, although his commentators have hitherto supposed him to have been acquainted with but one of these.

Finding that it was by exposure to the simple atmosphere, as well as by reception of moisture in rain and dews, that soil was fertilized, he reflected and conjectured what property there might be in the air thus powerful in its influence upon the earth with which it came in contact; and the only solution he could surmise, he expresses as follows: In Chapter V. (*Of* TILLAGE)—"The more internal superficies [for he keeps to this somewhat self-contradictory, but concisely-expressive term]

made by tillage, the more *dust* will be *made by the atmosphere* in proportion; and great clods, perhaps, are of no use to plants, but by that dust *they let fall, being thence extricated by the insensible ferment of the nitrous air;* and *the surfaces of this artificial dust must receive such operations from the air,* before the utmost fertility be obtained." Here he obviously describes the preparation of the food of plants out of pure earth or mineral matter by the chemical changes effected in it by atmospheric action. Easy readers of Tull are exceedingly liable to miss his real views, for the above remarkable passage occurs in an unimportant-looking foot-note. To show that we do not strain his meaning, take the following corroborations.—In Chapter XVII. (*Of* DIFFERENCE BETWEEN THE OLD AND NEW HUSBANDRY) he says that tillage includes two things, *pulverization* and *exposure to the atmosphere,* "without which, I think, the ground cannot be reduced to particles minute enough, or have their superficies *so impregnated* as to become a fertile pasture for plants." And again—"The superficies of the earth become *impregnated by the nitrous air.*" And again, in Chapter III., speaking of the surface of the minute clods of soil to which the pabulum is attached, he says, it is probable that "the nitre of the air may be necessary to relax this superficies, to render the prolific particles capable of being thence disjoined; and this action of the nitre seems to be what is called impregnating the earth." He also says that a plant cannot separate this fine pabulum from the parts to which they adhere without the assistance of *water,* which helps to loosen them when the above atmospheric action has rendered them capable of being disjoined. Hence the value of water as "a carrier to plants," and of the aërial nitre, "to divide and prepare the food." These are his words, which, however unphilosophic in some respects, yet describe the existence of chemical changes which actually take place: only a modern chemist would say, the admission of air and rain-water into the soil renders active the dormant mineral ingredients required by plants; that is, renders soluble either in water, or in water containing carbonic acid (as rain always does), the *inorganic* food which there exists in an insoluble state unfitted for vegetable nutrition.

We now come to the other class of food which he describes. Besides the minute dust adhering to particles of earth, there is also a great quantity of similar matter *present in water,* and which is conveyed along with it into the vessels of roots; but he does not conclude that the water first took it from off the "internal superficies." He considers rather that it consists of particles *which have already passed through vegetables,* been *exhaled into the atmosphere,* "together with very small pieces to which they adhere;" been there "divided by the aërial nitre, and *when the vapour is condensed, they descend with it to replenish the pasture of plants.*" None of the earthy charge that any water contains passes into roots, "except such fine particles which have all already passed through the vegetable vessels, and been thence exhaled." This conjecture is the more probable, for that "rain-water is as nourishing to plants set therein as spring-water, though the latter have more earth [or mineral food] in it; and though spring-water have some particles in it that will not enter entire into roots, yet we must consider that even that water may have been many times exhaled into the air, and may have still retained a great quantity of vegetable particles [that is, organic matter] which it received from vegetable exhalations in the atmosphere; though not so great a quantity as rain-water that comes immediately thence." It is evident that he has very little notion of different *qualities* in food supplied from the same source, but merely supposes the *minuteness of the size* of the particles as rendering them fit for being imbibed by plants, as we shall further see in considering his idea of the non-necessity for a rotation of crops. In further distinguishing the two sorts of food, he says that plants find upon their pasture "the particles which they have *from the earth or soil;* but they have *also* fine particles of earth *from water,* which may impart some of its finest charge to *the superficies of roots,* as well as to *the superficies of the parts of earth which make the pasture of plants.* If water does separate and take any of the mere pabulum of plants from the soil, it gives much more to it." Here we have distinctly the supply of organic food both *directly to the plant* and also to the *storehouses* or *pasture-grounds contained in the soil,* where, *in common with the inorganic food prepared in a different manner from the soil itself,* it awaits the appropriation of the root. Dews and rains, he considers, bring down this nutriment in considerable quantity. In Chapter IX. (*Of* WHEAT), he notices the novel ingenuity of a rain-gauge, and remarks that—"Could we as easily compute the true quantity of earth [vegetable or organic food] in rain-water, as the quantity of water is computed, we might perhaps find it to answer the quantity of earth taken off from our hoed soil annually by the wheat." And in several places he speaks of rain-water "dispersing its *riches*" to the soil in its passage through it. And he speaks of the food existing in the atmosphere as "effluvia" floating in the air; not sufficient to augment plants when suspended in the air, but being continually brought down by rain and dew into the soil. We think, then, it is plain that just as the first described phenomena correspond to the true chemical preparation of the inorganic potash, magnesia, lime, &c., in the soil, so the latter will very well answer to the known pro-

cesses by which nature supplies the organic carbon, hydrogen, and the ammonia for the sustenance of vegetables. As we have before said, however, it is not of vital consequence to Tull's system, that his particular views on this point should be as we interpret them; and after all, he does not seem to have entertained any very strong opinion of his own hypothesis, and was unable to substantiate his conjectures by direct proof. His doctrine, that each separate particle of pure earth became invested by exposure to air and moisture with a coating of fine pabulum, led him to the practice of minute pulverization in tillage. "The earth," he says, "dispenses or distributes her wealth to plants in proportion to the increase of her internal superficies, which is, the pasture of plants; so the atmosphere, by the riches of rains and dews, does annually reimburse her *in proportion to the same superficies*, with an overplus for interest." But where land is untilled and closed against the intimate admission of this food, it is "re-exhaled by the sun, and raised by the wind, both in summer and winter." "The external superficies of the earth, wherein is the pasture of cattle, cannot be enlarged without the addition of more surface taken from land adjoining to it, by enlarging its bounds or limits. But the artificial pasture of plants may be enlarged without any addition of more land, and this by division only of the same earth. And it may be increased in proportion to the division of the earth, which division may be mathematically infinite." And to show the inexhaustible nature of this means of providing new stores of food for plants, he says, in Chapter V.: "Every time the earth is broken by any sort of tillage or division, there must arise some new superficies of the broken parts, which never has been open before. For when the parts of earth are once united and incorporated together, it is morally impossible that they or any of them should be broken again only in the same places; for to do that, such parts must have again the same numerical figures and dimensions they had before such breaking, which even by an infinite division could never be likely to happen; as the letters of a distichon, cut out and mixed, if they should be thrown up never so often, would never be likely to fall in the same order and position with one another, so as to re-compose the same distich. Although the internal superficies may have been drained by a preceding crop, and the next ploughing may move many of the before-divided parts without new-breaking them; yet, such as are new-broken have, at such places where they are so broken, a new superficies which never was or did exist before. . . . We need not wonder, therefore, how the earth, every time of tilling, should afford a new internal superficies or artificial pasture, and that the tilled soil has in it an inexhaustible fund, which by a sufficient division [being capable of an infinite one] may be produced." And in Chapter IX. (*Of* WHEAT), he says that, though the roots of a crop may reach and feed through all the mould, they may still leave a sufficient "pasture" behind them, because they cannot come in contact with all the superficies in one year, any more "than when ten horses are put into a hundred acres of good pasture, their mouths come into contact with all the grass, to eat it in one summer, though they will go all over it. . . . The superficies of the fibrous roots of a proper number of plants [which do not overstock their pasture] bear a very small proportion to the superficies of the fine parts of the pulverized earth; for one cubical foot of this earth may have many thousand feet of internal superficies."

(To be continued.)

NOW THRUST IN THE SICKLE.

Now thrust in the sickle, the harvest is ready,
The golden corn waits for the reaper's strong arm;
The valleys with laughter and mirth are all ringing,
The hills are rejoicing, and dancing, and singing,
And bright is the prospect o'er many a broad farm.

Now thrust in the sickle, the bright mellow sunshine
Of August is resting on each drooping ear;
The rich burden'd clusters are gracefully bending,
The pure tints of nature in beauty are blending,
And sweet is the fragrance which fills the mild air.

How delightful to walk in the cool of the evening
Along the hill side on the corn-shaded path,
When zephyrs on sunbeams come bounding to meet us,
And wild birds are singing their joy-songs to greet us,
And the valleys repose in a heavenly bath!

How pleasing the landscape, how lovely, how charming!
Our senses are ravish'd, our feelings are raised;
The bounteous Creator o'er the face of all nature
Hath poured out rich plenty for each living creature;
Then with a loud anthem let His name now be prais'd.

Soon, soon shall we hear the loud song of the reapers,
Arising and mingling with the sweet woodland sounds,
Which awake with the dawning of the bright laughing morning,
When the first dancing rays of the sun are adorning,
And hanging with crystal the fruit of the grounds.

And soon shall we hear the wild joy of the gleaners,
As, delighted, they trip through the grassy green lane;
Our eyes, too, will gaze on the scenes interesting,
In field and in farmstead, on rustic swains resting,
On the fast rising rick and the high loaded wain.

Now thrust in the sickle, the harvest is ready,
The command will be sounded one day through the sky;
When angelic reapers will gather each nation,
The tribes and the kindreds of every station,
To the sifting tribunal establish'd on high!

Now thrust in the sickle, earth's harvest is ready,
'Tis a message from Heaven, and to man 'twill be dire;
The graveyard and abbey, the field and the ocean
Must yield up their contents with fearful commotion,
When the wheat will be garner'd, the chaff burnt with fire!

GEORGE HICKLING.

Cotgrave, Nottingham, 14th August, 1855.

COMPARATIVE PROFIT REALISED WITH DIFFERENT BREEDS OF SHEEP.

SIR,—My attention has been called to a letter from "A Constant Reader," in *Bell's Messenger* of the 27th of August, headed, "Comparative Profit realised with Different Breeds of Sheep," and in it I saw my name, with that of Mr. Ellman's, mentioned, wondering what we should say to the statement made by Mr. Druce, of Ensham, in reply to a letter from the American Minister at Paris, after his agricultural tour in England, where he inspected some of the principal flocks of sheep; but it seems he unfortunately did not see Mr. Druce's flock of half-breds; consequently, that gentleman compiled a table, showing in his estimation the value of various breeds in a tabular form, which appeared in the same journal of August 20th, and which called forth the remarks of "A Constant Reader," who, it seems, is a breeder of Southdown sheep himself. Mr. Druce, after sending his opinion of the different breeds of sheep to the American Minister, forwarded it to the late lamented Philip Pusey, Esq., by his request, and it was printed in the *Messenger* of August 27. Until then, I much regret that Mr. Druce's calculations had not come under my notice, more especially as I find they appeared in the *Royal Agricultural Society's Journal*, vol. xiv., p. 213, and consequently have so gone forth to the world. I have now inspected that table, and will comply with the wish of "A Constant Reader," in giving him my opinion upon it. In the first place, Mr. Druce has made an arithmetical error of £40 against the Southdowns. No small item in a sum of about £200! and one which should never have been published without a thorough investigation of its accuracy, as such a statement was calculated unjustly to depreciate one breed of animals, while bringing others more prominently into notice, as the difference is the whole £40 against Southdowns, and as a matter of course in favour of the other breeds. I must further remark on Mr. Druce's ideas of the relative value of the English breeds of sheep, and I presume they are but ideas, as Mr. D. does not show he *has tested their merits* in the tabular form sent to the American Minister and Mr. Pusey, by weighing out the different kinds of food to each of the different breeds of animals, throughout a stated time, the only fair way to come to a just conclusion; although even then, if the animals were all kept in close confinement, it would be in favour of one breed and against another. As, for instance, the animals possessing the least muscle and activity, would have a decided advantage over the Southdowns, as the former are, in a general way, kept on good grasses, where they lie quiet and get fat, while the Southdowns are calculated for a *wider ramble*, and often have a considerable distance to walk, backwards and forwards, to fold at night, which treatment would be injurious to all animals of less activity and muscle, so that persons generally adapt the kind of stock most suitable for their respective localities.

It is not my intention to try to disparage any of the different breeds of sheep, for the purpose of elevating the only kind I keep, viz., the pure Southdown; but, as they have been incorrectly placed in Mr. Druce's table, I think it but right to set the mind of "A Constant Reader" right about the merits of Southdown sheep. Mr. Druce only supposes a case; but he doubtless knows what are the weights of his ewes' fleeces, after having taken so much trouble with them, and he puts his *half-bred* ewes' fleeces from 4 lb. to 6 lb., which gives an average of 5 lb. This is, doubtless, right, as regards his own flock, and I will, therefore, let it stand so. But now for the poor Southdowns! and *poor, indeed*, must that sort be, according to Mr. D.'s estimate, the fleeces of which can only produce from 2 lb. to 4 lb. each! leaving the average of only 3 lb. I have just sold my wool to Mr. Waller, of Luton, Beds, who has had it for some years past, and I have looked over all my ewes' fleeces, which have brought up lambs (and a large proportion of twins), both at Babraham and Sawston, above 500 of them, and they average 5 lb. of wool each, and have done so for years past. I am also prepared to make any moderate bet that they will produce the same weight next year, if shorn at the same time. This being the case, I shall claim for the Southdowns 2 lb. more wool each, which, at the price Mr. Druce values it, amount on the 120 ewes, at 1s. 4½d. per lb., or 2s. 9d. per head, to £16 10s. But on again referring to the table, I find the sum total is made upon the *wool* and *carcase* of the *fat sheep;* I must therefore take the teg fleeces instead of the ewes, which, with the addition of 2 lb. on the tegs' clip at 1s. 6½d. per lb., amounts (on the 120) to £18 10s. more than Mr. Druce has put the wool at, which sum, added to the £40, will help up the Southdowns in Mr. D.'s list to £58 10s. more than he has put them at. I hope that "A Constant Reader" keeps a better kind of Southdown than Mr. Druce has described—viz., such as will only weigh 15 lb. per quarter, at from 12 to 15 months old; if not, I will undertake to say my hoggets, at the same age, weigh *at least* 10 lb. per sheep more than Mr. D. has put the Southdowns at, which, at his price of only 6¾d. per lb., will amount to the sum of £33 15s., and when added to the former sum of £58 10s, will make £92 5s. in addition to the Southdown figures in Mr. Druce's table; consequently, *his* account, with the exception of my alteration, will stand thus, viz.—

100 Cotswolds	£248	6	8
105 Leicesters	222	12	9
120 Pure Southdowns	296	7	6
115 Hampshire Downs	263	10	10
115 Crossbreds	292	18	0

I have sent you this account for insertion if you think the public will feel interested in the perusal of it, although I have but little time, and less inclination, to enter into a newspaper controversy upon this or any other subject. I beg to subscribe myself, your obedient servant, JONAS WEBB.

Babraham, near Cambridge, Sept. 12, 1855.

BLOOD is the red fluid that circulates in the bodies of animals, and has a saltish taste, a urinous smell, and a gelatinous consistence. On being exposed it is soon deprived of its volatile parts, which fly off in the nature of sal-ammoniac. It soon congeals and forms a trembling mass, of which the coagulated part is called "crassamentum," and is highly inflammable on being deprived of its watery particles. The other portion is the "serum," or thin part, and contains albumen, water, and a ropy mucus. Blood contains water, febrin, albumen, hydro-sulphuret of ammonia, subphosphate of iron, soda, muriate and phosphate of soda, phosphate of lime, and benzoic acid. Specific gravity 1.0527. Sea salt, a fine chalky earth, and a

small qantity of iron are said to have been found in blood; but the red particles thought to be iron are now considered to be a peculiar animal substance, having little relation to that mineral. Ox blood contains:—

Water	905
Albumen	79.99
Lactate of soda, and extractive matter	6.175
Muriate of soda and potash	2.565
Soda and animal matter soluble in water	1.52
Loss	4.75
	1000.000

Serum of human blood contains—

Water	905.
Albumen	80.
Muriate of potash and soda	6.
Lactate of soda and animal matter	4.
Soda, phosphate of soda, and a little animal matter	4.1
Loss	0.9
	1000.0

The buffy coat of blood is febrin, and closely resembles albumen in chemical properties. The above results differ according to the state of the animated body, and other circumstances. Blood contains certain quantities of all the principles found in the animal substances, and constitutes a manure of good quality. It has been much used for fruit trees; but the very limited quantity that can be obtained will deprive it of much attention; and a bed of fine earth, sawpit dust, or any similar substance, to absorb it, would appear to be the most economical preparation. It is mostly mixed with the offals of slaughter-houses, and with the ashes and animal dung in the pits of butchers' yards, where a substance of great value is found for mixing with farm-yard dung.

HARVEST HOME IN NORFOLK.—We alluded last year to an attempt which was made in the parish of Brooke to put an end to the system of publichouse harvest feasts, in which neither the wives nor the children of the labourers can join, and in which excesses of a gross description too often occur. The attempt has been repeated this year, and has been eminently successful, not only in regard to those immediately concerned, but as an example to other parishes in the county. On Friday last the festival was held at Brooke. Divine service commenced at 2 o'clock, and the church was crowded in every part, many being obliged to stand in the porch and churchyard for want of room within the walls. At the conclusion of evening prayer, the vicar of the parish, without selecting any formal text or preaching a set sermon, occupied a very few minutes in a simple and practical address. On leaving church the party adjourned to the lawn in front of the Vicarage-house, where preparations of the most ample nature had been made for their reception. About 400 men, women, and children—the harvest men and their wives and family—sat down to a substantial repast of old English face. Grace after dinner having been said, the toast of "the Queen and Royal Family" was right royally received. They were subsequently addressed by Mr. Holmes and Mr. Kett, the two resident principal proprietors of the parish and neighbourhood, to whose ready and generous help Dr. Beal, the minister of the parish, was mainly indebted for the means of carrying out his plans and arrangements for the fête. Many of the clergy and families of distinction in the district were present and took much interest in the proceedings. The happiness and decorum of the whole party will not soon be forgotten by those who witnessed it. A good band of music enlivened the scene with a selection of old English and other familiar airs. Arches of evergreens, with devices of good taste and character in flowers, all planned and executed by some of the villagers, enhanced the gaiety of the scene. Among others was a laurel arch, spanning the entrance to the vicarage garden, crowned by a miniature sheaf of corn, and with a "harvest home" in moss and flowers. Another which attracted much attention was surmounted by a magnificent floral crown, supported by the national flags of England and France, and ornamented with the Royal cypher. In addition to this, the tables were decorated with remarkably fine specimens of hollyhocks and dahlias. The enthusiasm and good feeling of the party at the close of the addresses of their landlords, no less than the admirable tone of the addresses themselves, formed the subject of much remark among the many witnesses of this rural festival. Nothing occurred to mar the festivity of the occasion; and about 8 o'clock the whole party, which, including visitors of every description, must have exceeded 600 persons, dispersed quietly to their homes, listening, as they went, to the strains of the National Anthem, and delighted with the entertainment and the events of the day, the arrangements for which had been personally superintended, from first to last, by Dr. and Mrs. Beal. Before they left, tea and coffee, and fruit were served to the guests of the day and enjoyed by all. Copies of the *British Workman* had been procured for distribution among them as they sat at table; and, as the shades of evening began to close, a display of fireworks, prepared by an amateur professor of pyrotechnics in the village, terminated the festivities. The day will be long remembered in Brooke, and several parishes are on the point of imitating the example in different parts of the county. At the reasonable hour already named the homes of the village were once more tenanted, and husbands, wives, and children, exhilarated, happy, and thankful, were preparing to retire to rest, once more to resume, with renewed cheerfulness and increased vigour, their labours and toils on the morrow.

THE FOOD QUESTION IN FRANCE.

[FROM THE MONITEUR]

The Government very properly continues to bestow its attention on the question of the supply of food, which is always a fit subject of concern. This is the third time within these three years that the high price of corn has imposed great sacrifices on the country. In this difficult emergency the Government will not fail to do its duty.

Let us examine the state of the case.

France produces annually, on an average, 82 million hectolitres of wheat. Let us suppose that this year the harvest has only yielded 75; there would be a deficit of 7 million hectolitres. Now, so long as these 7 million hectolitres shall not have been replaced in France by foreign produce, there exists no human means of reducing the price. The great concern, therefore, is to have this amount of wheat brought as rapidly and economically as possible from abroad. Once brought, it is necessary to have it diffused as easily as possible throughout all parts of the empire, so that it may not leave them again. That once accomplished, prices will go down by the natural course of things.

What, then, is the best mode of procuring these 7 million

hectolitres? Is it, as some propose, by reducing the price artificially? Is it by compelling the holders to sell in a certain manner, in certain places, at a certain rate? Is it by giving a bounty on importation? We do not think so. If by an active mode Government should be so imprudent as to wish to lower the average prices of grain by causing wheat to be sold at a low price; should the Government wish to take inquisitoral measures against the holders, these resolutions would occasion a result directly the reverse of what it wishes; fear would seize upon all who hold corn; it would disappear from the markets; people would rather hide it than sell it, and the reduced price being merely artificial, could not be long maintained; foreign corn obtaining no longer its fair profit in our markets, would cease to enter France, and we should be inevitably overtaken by scarcity, seeing that it is just as impossible to impose by force a price upon provisions in general as to prevent water from finding its level. The famous law of the maximum, of inauspicious memory, was an evident proof of the mischief that may be done by ignorance in respect of political economy. Confidence and freedom in all transactions are the unchanging bases of prosperity in trade, and consequently the causes of abundance.

As for giving a bounty on the importation of corn into France, some persons imagine that the price of corn would be reduced by the amount of the bounty. The experiment was tried in 1816, and did not succeed. In fact, were the Government to declare that it gives a bounty on the importation of corn, at the end of a very short time the foreign producers and dealers would raise the price to the full amount of this bounty; and the measure would merely end with enriching foreigners, to the detriment of French producers and consumers.

What, then, is to be done? It is, according to the decree of the 8th of September last, to open for more than another year our frontiers to all the alimentary supplies of foreign countries; to prohibit the exportation of them from France; to facilitate the conveyance along railways and canals, by rendering it less expensive, so as to equalize as much as possible the prices of corn over the entire territory; to encourage, excite, and second purchases abroad; to leave the most perfect freedom to every transaction, vigorously prepared to put the law in force against any culpable tricks having for their object the creating of an artificial rise by means of coalition; to stimulate public and private charity at the moment when bread is dearest; lastly, to give rise by every means to work in the land, for if we succeed in creating a greater demand for work, and consequently in rendering it dearer, the workman will obtain a remunerative price that will to a certain point be a set-off to the high prices of food. We may as well say here, that the low price of articles of food is not always the proof of prosperity. There are countries where corn, for instance, is worth very little, and where the inhabitants, for all that, are in the deepest distress, because, from the absence of industrial and trading activity, they cannot buy in sufficient quantity food of the first necessity, even at the trivial price at which it is offered for sale.

Besides, it is an incontestable truth that the rise in the price of corn alone enables the deficit to be made good; for, beyond a doubt, foreign producers and merchants will not bring corn to our markets, unless they find there a reasonable profit, and complete security for their transactions.

This is so true, that the rise in corn has already very opportunely roused commerce. It has occasioned numerous orders and important purchases abroad; and not merely the arrivals that will be the consequence of them will naturally tend to lower the prices, but the simple knowledge of this fact will concur to the same end, so soon as it shall be known by the French producers.

Let the country, then, be reassured! The Government watches; and, engaged especially about the welfare of the most numerous class, it will know how to take the most prudent and efficacious measures, at the same time that it will resist all unreasonable demands with the strength that love of the right and the feeling of duty confer.

THE WHEAT TRADE.

No. V.

Sir,—The season is now drawing to a close, and it will very soon be seen whether the anticipations expressed in my last two letters were correct. So far as we have gone hitherto they have been realized by the falling off in the supply of native wheat, indicating the approaching exhaustion of the stocks in the farmers' hands. We may well expect such a result of the year's operations when we come to consider that we have for ten months been living almost exclusively upon it, the quantity of foreign wheat imported in that period being a mere bagatelle compared with the consumption; a large proportion of it being also still in granary. Up to the 5th July, the amount of wheat, and flour as wheat, imported was only 2,137,261 qrs., a considerable proportion being hard Spanish* and Egyptian, which can only be used very sparingly by our millers. The result of the season, thus far, proves to demonstration that the crop of last year exceeded the average by at least five million quarters. We have, however, eight weeks more to wait before we get a supply of new wheat; in which interval we shall probably find the supply exceedingly scanty and insufficient for the demand. This will compel the country millers to flock to Mark Lane and other parts where foreign wheat is stored, the holders of which will soon find their stocks vanishing.

Notwithstanding the enormous amount of last year's crop, prices have ruled unusually high throughout the whole season, with the exception of two or three weeks at the close of last harvest. The sudden and rapid advance which afterwards took place, and the steadiness of the market from that period, prove that the decline was produced rather by the apprehensions of the dealers than by the actual state of the trade. It was well that prices were high, otherwise we should certainly have been unable to procure any foreign supplies, the state of the continents both of Europe and America, in respect to stocks, being equally unsatisfactory with that of England.

* Of hard Spanish the quantity is small; but that of Spanish flour has been large, and of excellent quality.

It is worthy of remark that the high price of wheat, maintained so steadily throughout the whole season, has been entirely the result of what may be justly termed legitimate trading; for perhaps there never was a season in which there was less speculation in wheat than during the past year, or in which the range of prices has been so narrow; the fluctuations since last October having scarcely amounted to more than 6s. or 8s. per qr. Taking into account the unusual largeness of the produce, and the high price, the farmers have every reason to be satisfied with the result of the year's trading.

The reports from the provinces, the last fortnight, of short supplies, are fully confirmed by the general advance in prices; whilst the London market has remained almost stationary. The advance, indeed, has been ascribed to the farmers being too busy in out-door work to attend to thrashing. This may be the case to a certain extent; but I apprehend it will be found to arise mainly from the exhaustion of the stocks of wheat in the farmers' hands—so far, at least, that they do not care to send the remainder to market, to force a sale upon a dull trade. Even where the supply is still abundant, the tendency is to an advance. This was the case, for instance, at Norwich and Fakenham markets last week, where, although the millers bought sparingly, the merchants came forward, and cleared the market of the surplus at an advance of 1s. to 2s. per qr.

It is a usual thing for the country markets generally to take their tone from Mark-lane. In the present instance, however, it is the reverse; the former having taken the lead in a very decided manner, whilst the latter is absolutely suffering herself to be flogged up by a short supply—so unwilling are the town millers to submit to the rise. They cannot, however, help themselves; and when the country millers come to lay violent hands upon the stocks of foreign wheat, they will be compelled to believe there is something in it. It is well known that neither the millers nor bakers hold any stock beyond the immediate consumption of the week, and must therefore yield with the best grace they can to the exigencies of their position. In Essex and Kent, from which counties the London market draws its chief supply of the best wheats, the farmers are nearly all cleared out; and I believe the parts of the country where there is any surplus beyond the local demand are now very few indeed. I question whether there may not yet be a *hiatus* between the old and new crops, that will be exceedingly difficult to fill up; in which case those who still have wheat to sell will make their own market of it.

It is a relief, under these circumstances, to know that the Danube is open to neutral ships, and that a considerable number—(between two and three hundred, it is said)—of wheat-laden vessels have already sailed from Galatz, Ibraila, &c., for European ports. These will touch at some neutral port on the continent, for form's sake, and then in all probability make for an English port as their ultimate destination. This is quite an unexpected feature in the trade, and if it continues will not be without its effect in the ensuing season. We learn also that in the United States and Canada the crop is generally an excellent one; in which case they will have a good deal to spare for us. It must, however, be taken into account, that they also will begin the season with an exhausted stock and at high prices; and that, as was the case the two last years, there will be a competitive demand between ourselves and the French, who are as far from being in a safe condition in regard to stock as ourselves.

What, then, are our prospects for the next season, as it respects supplies and prices? These are questions more easily answered negatively than positively. I will say with confidence, first, that we shall *not* have more wheat, import as much as we can, than will serve for the year's consumption; and secondly, that we shall *not* have lower prices than we have had throughout the last season. I ground my first assertion upon the fact that we cannot have more than the average crop of 16,000,000 qrs., according to the present prospect, which is at least 5,000,000 less than last year, and the same quantity less than the annual consumption. In the past year we have not been able to import more than 2,500,000 qrs.; and if the crops abroad enable us to double that amount next year, it will only barely make up enough for the year's consumption, leaving us, at the following harvest of 1856, precisely in the same unsatisfactory condition as we are at present. And with regard to the second assertion I say, if with the largest crop that ever was grown in the United Kingdom we have been unable to keep down the price, owing (as I believe) to the knowledge that we had *only* the native produce to depend upon, it is not likely that, with a crop at least one-fifth less in amount, and the means of making it sufficient for the year's consumption depending upon many contingencies over which we have no control, we should have a lower range of prices than last year.

Notwithstanding this, I cannot hold with your correspondent, "Constant Reader," who, I see, is still harping upon the doleful string, and prognosticating famine. Our means of averting such a catastrophe are too numerous in this country to admit of it. Perhaps the most efficient of these means is the facility of intercourse between the different provinces by means of railroads, by which the supplies of all kinds are now equalized in a manner that could not be done formerly. If wheaten bread, too, were to become scarce, the people could fall back upon a coarser kind of cereal, without injury either to health or comfort. Even in Ireland much suffering arose from the prejudice in favour of certain kinds of food, and against other kinds. For instance, a large landed proprietor purchased twenty or thirty tons of rice, for distribution amongst the poor; but, although they were at the time starving to death by hundreds, not a hundred-weight of the rice could be disposed of, and he was compelled to send it back again to England at a great loss. Such was also the prejudice against Indian corn, that in one instance the attempt by a clergyman to enforce the use of it in his family was near costing the lives of the whole. So determined were the servants not to submit, and so exasperated were they at the attempt, that they actually poisoned the puddings

that were made of it: the whole family were taken ill, and the eldest son died, the rest having a very narrow escape. Yours faithfully,

London, 20th July. S. C.

No. VI.

Sir,—My last letter on this subject was dated the 20th of July, at which time there was every prospect of the harvest being generally a full average one, both here and on the continent of Europe; so that we had reason to hope we should be able to make up the supply to meet the next year's consumption by an importation from abroad, unrestricted by a competitive demand for any other country. Since that period, however, the appearance of things both at home and on the continent has materially altered for the worse; and although I do not even now apprehend or anticipate a famine, with our friend "Constant Reader," I do foresee some difficulty in obtaining the supply of foreign wheat that will be wanted to make up the annual consumption. This subject I shall go into more at large on a future occasion, when the actual results of the harvest now in progress are better known and understood. The intention of my present communication has reference rather to the past than the future—a retrospect of the agricultural season which closes with the present month, and which, all things considered, has been one of the most remarkable I ever remember.

On looking back at my letter of the 20th of September of last year, I find that I estimated the quantity of wheat then in the country at 21,614,285 quarters, which was just sufficient to meet the annual demand I omitted, however, to take into account the excess in the product of flour owing to the excellent quality and condition of the wheat. The average weight per bushel was at least three pounds more than usual, which would create an increase of at least five pounds of flour per bushel, or forty pounds per quarter. This, upon twenty million quarters, adds an increase to the production of about 1,700,000 quarters; and it satisfactorily accounts for the way in which the stock of wheat has held out to the present time, without any deficiency in the supply great enough to cause inconvenience.

With regard to the importations from abroad, I overestimated them at that time, upon the presumption that the ports of the Black Sea would not be totally shut against us. This, however, proved an error; in addition to which, the supply from the United States and Canada failed us after the first few months before Christmas, owing to the deficiency in their own crops, which completely annihilated their exporting power for the season; their prices, indeed, have of late been higher, when freight and expenses are added, than those in England, or Europe generally. These two disappointments took off about 1,200,000 quarters from my estimate, which was as high as 3,750,000 quarters. I corrected this as soon as the condition of America became known; and in my letter of the 20th May reduced it to 2,500,000 quarters. In point of fact, that is about the quantity, within 50,000 quarters, that has actually been imported since the 1st September, 1854, to the present time. A considerable proportion of this, however, was from Egypt, which is not generally available here as breadcorn, except in very small quantities.

That the stock of old English wheat is nearly run out is proved by the very small supply sent to the London market the last few weeks, and the scanty one in those of the provinces. Undoubtedly there are still some farmers who, knowing the low state of the stocks, and calculating upon a deficiency in the present crop (which there certainly is in some districts), and coupling this with the fact of the war, have kept a portion of their wheat, and speculated upon a rise in prices after harvest. But I am convinced that the number of these is very small indeed; that the farmers generally have been satisfied with the prices they have obtained, and resolved to sell out; and that, consequently, the stock of old English wheat on hand is reduced to the minimum, and can scarcely be taken into the estimate of the supply for the ensuing season.

But it is in regard to prices that I look upon the past season as anomalous and extraordinary. Never, indeed, since the last war, have the farmers had so much cause to be satisfied; and never were the expectations of the public generally, as to price, more severely disappointed. With a crop of wheat confessedly the largest that was ever grown in this country—some instances of even fabulous quantities being recorded—the range of prices has been as high as in the previous year, when there was an acknowledged deficiency to the extent of ten million quarters in the crop and stock, as compared with the consumption. This high range of prices must, therefore, be ascribed to some cause, or combination of causes, totally irrespective of the year's produce. To speculation it certainly was not owing, for perhaps there never was a season when less disposition was displayed on the part of the merchants and millers to speculate; which is proved by the narrow range that prices have taken throughout the year, the fluctuations having been remarkably few and small. I therefore ascribe the high scale of prices partly to the conviction that we had nothing but the crop of 1854 to depend upon, and partly to the farmers being universally richer than formerly; by which they have been enabled to bring their produce to market with more deliberation than usual, and in such weekly proportion as to avoid glutting the trade. A good deal, also, is owing to the flourishing condition of the finances of the country, so different to what they were in the last war. The abundance of employment in the manufacturing districts has also prevented, in a great measure, those complaints and heart-burnings which formerly prevailed when the price of bread was high. Wages generally have been in proportion to the price of bread; and few indeed have been the instances in which much suffering has arisen from it.

The result of the season, as it respects the imports from America, proves to a demonstration what I have advanced in my former letters—namely, that in that country, as well as in Europe, production, on the average, keeps pace with consumption, the population

increasing quite as fast as the cultivation of the land, and that for the last forty years there has been no increase in the export of wheat and flour to this country. The average quantity has been under 800,000 qrs. per annum; and, although in 1853-4, stimulated by our high prices, they sent us about 1,600,000 qrs. in wheat and flour, the stock in the States was so exhausted by the effort, that a short crop has raised prices with them above our own. We shall, however, in future probably obtain from thence increasing quantities, by the cultivation of the prairies, which require so little tillage, besides being far more fertile and productive than the States on the Eastern seaboard. By a statement which appeared in your journal lately, copied from the *New York Herald*, I perceive that the writer estimates the crop of wheat of this season in the wheat-producing States at 168,572,000 bushels, being 68,000,000 bushels above the crop of 1849. The writer also estimates that one-third more land has been brought into cultivation in the western States since 1849. This latter estimate I believe to be perfectly correct—an enormous stimulus having been given to production by the high prices in Europe, and the increasing facilities for conveying the produce thither. I very much question, however, the correctness of the estimate of this year's crop. Until the last two or three years the whole growth of wheat in the United States did not exceed from eight to twelve million quarters; and to advance from this to twenty-one millions is too great a leap to be credited. The western prairies, too, require to have their fertility reduced for two or three years by repeated crops of Indian corn before wheat can be grown to advantage. I shall, however, be able to give further correct information on this subject in a future letter—having a friend in New York who is collecting it for me, for which his position, as a general merchant, affords him abundant facilities.

I am informed that the French Government has sent out orders to America for the purchase of wheat and flour, the crop in France being a deficient one. If this is the case we are likely to have a competition there as we had in 1853; and I do hope that our merchants will profit from the experience of that year, by refraining from binding down their agents with a maximum price, by which they then lost the opportunity of purchasing before the advance. We shall *certainly* want all the wheat we can obtain from thence, and our prices will, in a great measure, be regulated by those of New York, *and not theirs by those of Mark Lane.*

The advance in price which took place in our market the last few days was occasioned partly by the appearance of some French buyers in Mark Lane, by whom, however, but small purchases were made. *They are still here*, watching the market, and should our prices recede a little, will doubtless lay hold. The present price of flour in Paris is 100 frs. per sack of 350 lbs., or 66s. 8d. per sack of 280 lbs.; this is 1s. 4d. below our present nominal price of town-made households; but I believe their *actual* price is more in accordance with the return than ours, and that the price of wheat is more strictly regulated by it than with us.

In my next letter I shall endeavour to lay before you the general results of the harvest in regard to the wheat crop, and the prospect of the coming season.

London, Aug. 31. Yours faithfully, S. C.

THE PARIS UNIVERSAL EXHIBITION.

ALIMENTARY SUBSTANCES.

Professor Owen, who is the British juror on alimentary substances, has very properly directed the notice of our Board of Trade to two exceedingly important points in the present Exhibition, the illustrations of which will be found in the French department of the Annexe. Both refer to the application of preserved food to the Commissariat of the Army and Navy, and with reference to the first he observes—

"I believe the meat biscuit from Texas, and the biscuit-bœuf exhibited by Beurmann, Rue Rousset, 29, to be worthy of attention, and I would request a perusal of the certificate of the Inspector-General of the French Troops De Veuchère and of General Mylius, on the subject of the latter article, which I believe to be equally applicable to the long-known American product of M. Gail Borden."

In speaking of Gail Borden's meat biscuit, Dr. Lindley—another high authority—thus decisively expressed himself before the Society of Arts in 1852:—

"We (the jurors) were told," he said, "that its nutritive properties were of a very high order; it was stated that 10lbs. weight would be sufficient for the subsistence of an active man for 30 days; that it had been used in the American navy, and had been found to sustain the strength of the men to whom it had been given in a remarkable degree. Statements were made to us, which have since been corroborated, that it would keep perfectly well without change under disadvantageous circumstances. Colonel Sumner, an officer in the United States Dragoons, who had seen it used during field operations, says he is sure he could live upon it for months, and retain his health and strength. The inventor, he says, names 5 oz. a day as the quantity for the support of a man; but he (Colonel Sumner) could not use more than 4 oz. made into soup, with nothing whatever added to it. The substance of these statements may be said to amount to this, that Borden's meat biscuit is a material not likely to undergo change, is very light, very portable, and extremely nutritious. A specimen placed in the hands of Dr. Playfair for examination was reported by him to contain 32 per cent. of flesh-forming principle; for it is a composition of the essence of meat and the finest kind of flour. Dr. Playfair stated that the starch was unchanged; that consequently there could have been no putrescence in the meat employed in its preparation, and that the biscuit was 'in all respects excellent.' The jury and others tasted it, and we found in it nothing which the most fastidious person could complain of. It required salt or some other condiment, as all these preparations do, to make them savoury. No foreign matter had been introduced into its composition;

there was no salt to absorb moisture, and nothing else to interfere with the property of flour or of essence of meat. These biscuits are prepared by boiling down the best fresh beef that can be procured at Texas, and mixing it in certain proportions with the finest flour that can be there obtained; it is stated that the essence of 5lb. of good meat is estimated to be contained in 1lb. of biscuit. That it is a material of the highest value there can be no doubt; to what extent its value may go, nothing but time can decide, but I think I am justified in looking upon it as one of the most important substances which this exhibition has brought to our knowledge. When we consider that by this method, in such places as Buenos Ayres, animals which are there of little value, instead of being destroyed, as they often are, for their bones, may be boiled down and mixed with the flour which all such countries produce, and so converted into a substance of such durability that it may be preserved with the greatest ease and sent to distant countries, it seems as if a new means of subsistence was actually offered to us. Take the Argentine Republic, take Australia, and consider what they do with their meat there in times of drought, when they cannot get rid of it while it is fresh. They may boil it down and mix the essence with flour (and we know they have the finest in the world), and so prepare a substance that can be preserved for times when food is not so plentiful, or that can be sent to countries where it is always more difficult to procure food. Is not this a very great gain?"

So spoke Dr. Lindley of meat biscuit in 1852, and the recommendation is now taken up and reiterated by Professor Owen. But will our military and naval authorities take any step in the matter? Will any other department that might lend a helping hand to so important a branch of production struggling into life give it the slightest assistance? Has it been tried in the Crimea? or has any notice whatever been taken of a substance which won a council medal at the Exhibition of 1851, and which would have been invaluable as a substitute for the poisonous salt pork with which during the whole of last winter we fed our soldiers in the East? Again, with reference to preserved vegetables by desiccation, Professor Owen observes that they are of various value, from their diminished weight, as articles of food on a due proportion of which with animal food so much of the healthy state of the blood depends. He states that Commissary-General Ramsay is aware of the importance of this discovery, but that fact will go a very little way in securing their supply either to the army or navy. A large quantity of these preserved vegetables was afforded to the sick and wounded in the Crimea last winter at the expense of *The Times* Fund, and they were found of essential benefit in the hospitals. The value of the process depends on the very small proportion of the elements involving the flavour and nutriment of vegetables which is allowed to escape with the purely aqueous constituent, the expulsion of which facilitates their transport, while cooking restores them to their original bulk.

MOWING MACHINES AND STEAM PLOUGHS.

Rev. H. W. Beecher, in the *Independent* of last week, thus speaks of these great labour-saving implements.

* * * * * *

But if a mower had taken a notion about the time we did to come to Lenox, what a world of work would have been spared to human muscles! Here are thirty-five or forty acres of grass, over which, in half circles, advancing four or five inches at a clip, the men have crept, shuffling along with their feet, crouched and sweating, hot, and tired in the small of the back. Two men will mow, say four acres a day. Besides looking after that which was cut yesterday, here are ten days' work. But throwing out the Sabbaths, and throwing in the rainy days (which this year have striven to wipe out the memory of every day of last summer's drought), and there will be at least ten days more, or full three weeks of haying; *i. e.*, mowing, watching the barometer (that is my part of the work), dodging showers, or nesting in the dry hay, with the showery west coming down upon us with black banners flying and thunder trumpets sounding. However, these occasional matches between the storm and the farmer's whole family are not the least interesting and exciting of country sports. There is no game of ball like it, no rowing match can be compared to it. As for a horse-race, it is a mere piece of vulgar cruelty in comparison. * * * * * * *

Let us see; how did we get to this spot? Ah, we started with a mowing-machine. Well, we wanted to say that if, instead of these slow but peaceful scythes, we had had one of these mowers with iron sinews, that is never hurt or tired, or sweaty, but rolls quietly along over twelve acres a day, and then tucks up its knives at night as if it had been out walking for a little sport in the grass—how much time would have been gained, how much struggle saved, how easily, on the few fair days, fair but hot, might we have cut and cured the whole crop without being chased out of the field by storms!

In that case we should have had our barley all harvested before this. Now it is crinkled, and will require twice the labour to secure it. Our wheat too, spring wheat, would have been attended to before this. Now it is all down. May be it is sprouted. Perhaps it will mildew, or it may rust.

We are accustomed to regard the improvements in machinery chiefly in their relations to manufacturing and locomotion. But nowhere else will a greater change be wrought by machinery than upon the farm. We are in the infancy of agriculture.

The knowledge of the elements with which we deal, and which compose rocks, soils, plants, and animal fibre, that organic chemistry puts into our hands, gives direction and accuracy to our processes, but does little to abridge manual labour. Mechanics step in at this point, and promise to set men free, and to make a servant of iron that will toil for him without fatigue and with quadruple speed.

Great as is the saving of labour achieved by reapers, mowers, threshers, etc., they are all as nothing in comparison with that which must come before long—THE STEAM PLOUGH! What a revolution would take place when a gang of five or six ploughs, cutting from fifteen to twenty-four inches deep, shall plough from thirteen to fifteen acres a day! A farm of twenty acres will then be equivalent to a hundred acres now. A hundred acres so cultivated will yield unexampled crops. It will be better for small farmers than it would be to make every man a present of four times as much land as he had before.

Then, too, large farming could be carried on without the drawbacks which now hinder it. A thousand acres ploughed, tilled and reaped by machinery, could be handled as easily by the proprietor as now he handles a hundred acres.

As yet we have only scratched the surface of the earth. We have never fairly harnessed mechanics, or made a farmer of science.

The man who invents a steam plough that will turn twelve or fifteen acres a day, two feet deep, will be an emancipator and civilizer.

Then labour shall have leisure for culture. Thus working and studying shall go hand in hand. Then the farmer shall no longer be a drudge; and work shall not exact much and give but little. Then men will receive a collegiate education to fit them for the farm as they now do for the pulpit and the forum; and in the intervals of labour, gratefully frequent, they may pursue their studies; especially will books be no longer the product of cities, but come fresh and glowing from nature, from unlopped men, whose side-branches, having had room to grow, give the full and noble proportions of manhood from top to bottom. God speed the plough!

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weat'r.
1855.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Aug 21	29.87	29.96	61	74	59	W. S. W.	lively	fine	sun	clear	dry
22	30.06	30.00	59	74	62	W. S. W.	lively	fine	sun	cloudy	dry
23	29.98	29.76	57	77	64	S. East	strong	cloudy	sun	fine	showery
24	29.77	29.91	60	73	61	S. West	gentle	cloudy	sun	cloudy	showery
25	30.05	30.05	53	72	58	S. West	gentle	fine	sun	fine	dry
26	30.07	30.08	53	71½	55	W. by S.	gentle	fine	sun	bright	dry
27	30.07	29.73	52	71½	61	W. S. W.	gentle	fine	sun	fine	dry
28	29.87	29.89	60	73	60	South	gentle	fine	sun	fine	dry
29	30.05	30.16	55	73	57	Westerly	gentle	cloudy	sun	fine	dry
30	30.30	30.30	52	72	57	E., variable	gentle	cloudy	sun	cloudy	dry
31	30.30	30.23	50	70	55	E. by S.	gentle	fog	sun	cloudy	dry
Sept. 1	30.32	30.37	49	65	53	N. by East	airy	fine	sun	clear	dry
2	30.36	30.25	50	62	55	N. by East	brisk	cloudy	cloudy	cloudy	dry
3	30.20	30.06	49	62	56	N. by East	airy	fine	sun	fine	showery
4	30.06	30.00	55	67	59	E. N. E.	gentle	cloudy	cloudy	fine	dry
5	30.01	30.10	56	63	51	E. N. E.	brisk	fine	cloudy	fine	dry
6	30.22	30.39	46	59	52	E. N. E.	brisk	fine	fine	fine	dry
7	30.44	30.44	43	65	50	Easterly	gentle	fine	sun	fine	dry
8	30.44	30.26	41	68	54	South	airy	fine	sun	fine	dry
9	30.22	30.16	48	68	52	N. West	gentle	fine	sun	fine	dry
10	30.16	30.10	44	65	54	N. East	gentle	fine	sun	fine	dry
11	30.10	30.10	45	68	55	N. by E.	gentle	fine	sun	fine	dry
12	30.20	30.15	47	69	56	W. by N.	gentle	fine	sun	fine	dry
13	30.05	29.95	51	70	59	S. West	gentle	cloudy	fine	cloudy	rain
14	29.96	30.06	56	58	55	N. by E.	gentle	cloudy	cloudy	cloudy	rain
15	30.11	30.12	49	62	55	Westerly	gentle	fine	sun	fine	dry
16	30.10	30.07	55	66	60	W. S. W.	gentle	fine	fine	cloudy	dry
17	30.10	30.02	56	58	58	Easterly	gentle	cloudy	cloudy	cloudy	rain
18	30.02	29.97	56	70	60	Variable	still	fine	sun	cloudy	dry
19	30.00	30.04	57	68	58	S. West	still	fine	sun	clear	dry
20	30.14	30.24	50	72	58	S. West	gentle	fine	sun	fine	dry

Estimated Averages of September.

Barometer.		Thermometer.		
Highest	Lowest.	High.	Low.	Mean.
30.410	29.410	76	36	57.8

Real Average Temperature of the three Columns.

Highest.	Lowest.	Mean.
67.80	53.26	57.26

Weather and Phenomena.

Aug. 21.—Clouds rapidly moving. 22.—Fine sunset. 23.—After great heat, a storm at 5 till 6 p.m.; at 8 commenced the electrical display, which was constant, superbly brilliant, till 2 next morning; it stands unrivalled as an atmospheric phenomenon, little connected with the earth: rain fell at Croydon to the extent of 0.67 cents. 24 to 31. —Settled fine weather.

Lunation.—Full Moon, 27th day, 1 h. 27 m. afternoon.

Sept. 1.—Gloomy, clearing at sunset. 2.—Cold, ungenial. 3.—A trifling shower. 4.—Changeable. 5.—Threatening clouds. 6.—Fine intervals, clouds, and gusts of wind. 7 and 8.—Superb. 9.—Fine. 10.—Cloudy masses, clearing. 11.—Some haze, but quite dry. 12.—Beautiful. 13.—A great shower very early, and more at times. 14.—Variable. 15.—Beautiful day. 16.—More cloudy. 17. —Drizzle and a shower. 18, 19, 20.—Fine and warm days.

Lunations.—Last quarter, 3rd day, 8 h. 24 m. a.m. New moon, 11th day, 10 h. 52 m. a.m. First quarter, 19th day, 7 h. 1 m. a.m.

Remarks connected with Agriculture.

The whole period has been benign, and perfectly favourable for bringing the rich harvest to its home in thorough condition. The total fall of rain has been about 1 in. 12 cents., and it proved of great value to the mangolds, cabbages, swedes, and grasses. Much second-crop hay has been made and secured. More rain would be desirable, as the season, though rather cooler than in 1854, has been so brilliant. Upon the whole, murmur as some may do, there is abundant cause for thanksgiving and confidence.

J. Towers.

Croydon, Sept. 20.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR SEPTEMBER.

From the extreme fineness of the weather, harvest operations have progressed steadily during this month, and, with the exception of a few patches of oats and beans, nearly the whole of the crops have at length been secured. Considering that the harvest has suffered very few atmospheric interruptions, cutting and carrying have been prolonged far beyond the usual period; but this has been the result of a deficient amount of labour, and the impossibility of active progress. Fortunately for the growers, therefore, as well as for the country at large, we have been favoured with a long continuance of fine weather, and the crops almost generally have been secured in excellent condition. With all this, however, complaints are rife on the subject of the marketable value of a large portion of the wheat crop; and it cannot be denied that there is a wider margin between the quotations of the finest and the most inferior samples than could be desired. Then, again, we are told that the wheat crop is thrashing out very deficient both in point of yield and quality, notwithstanding the splendid prospect of the crop prior to the commencement of cutting. At the present time—when the growth of wheat in France is officially admitted to be over 2,000,000 quarters short of an average return, and when no supplies can reach us from Russia—these features in the trade are of the highest possible importance, and require more than ordinary consideration. But let us calmly consider for a moment what our position really is—whether, in other words, we ought to take alarm at what some parties call a deficient crop. To compare the present yield of wheat with 1854 appears to us to be extremely unfair, because we all know that the growth last year was the best and largest on record; and yet our readers will recollect that in the months of October and November last year numerous growers contended that there was a deficiency in it. If we desire to arrive at an accurate conclusion on the subject, we must not take a year of *unusual* abundance, but an *average* season; and really when we do so—selecting 1852 as the basis of our calculation—we see nothing in the present year's growth, allowing for the immense increase in the breadth of land under wheat culture, to excite our fears as regards future supply or price. That we shall have to import largely of foreign produce to meet consumption, does not admit of a doubt; but our impression is that we shall be enabled to procure all the corn that may be required without leading to extravagantly high rates. The yield of barley appears to be good as to quantity, but very deficient in quality. As regards all other spring corn, our accounts state that their yield is limited, though equal to 1854.

On the continent of Europe—but more especially in France and in the Lower Baltic ports—a considerable advance has taken place in the value of all kinds of grain; but our correspondents in the United States inform us that flour has fallen to a price sufficiently low to admit of heavy shipments to England. This latter feature in the trade has had considerable influence upon the demand for wheat, and prices have given way at Mark Lane from 4s. to 6s. per qr.

Numerous advices have come to hand from all parts of the United Kingdom on the subject of the potato crop. From these we learn that the disease is increasing in some districts, and that a large portion of the crop has been lost. We, however, are inclined to the opinion that many of the statements are over-charged, and that the total loss will be found much smaller than is anticipated.

A great scarcity of hay is felt nearly all over the country, and the price is now very high. Evidently the first-cut of meadow hay was unusually small; the second-cut has turned out tolerably large, but the supply will be found inadequate to meet the demand. High currencies, therefore, may be looked forward to. Very little progress has been made in ploughing this month, even in the most forward districts, and agricultural labours generally are in a very backward state.

The cattle markets have exhibited increased supplies of both beasts and sheep, mostly in very middling condition; and the trade has ruled very inactive, on rather lower terms. The imports from abroad, notwithstanding that France is drawing large supplies from Holland, have exhibited an increase compared with some previous months.

After a long continuance of extreme inactivity, the demand for English wool has somewhat improved. No actual advance has taken place in prices, arising from the near approach of rather large sales of colonial wool and the improvement in the value of money. The stocks in manufacturers' hands have become very moderate.

The growth of hops is turning out unusually large, and it is estimated that the duty will exceed

£300,000. The general quality of the samples shown in the Borough is unusually fine. In Germany, a large surplus quantity of hops—estimated at 200,000 cwts.—has been produced for shipment. New hops, which realized in September last year from £18 to £23 per cwt., have sold at from £4 to £6 10s. per cwt.

Although large supplies of linseed have reached us from India and some other quarters, and which have exceeded the falling-off in the usual imports from Russia, the demand for that article has been active, and prices have considerably advanced, 80s. per qr. having been paid for fine English. Cakes have sold briskly, at full quotations.

The root crops are turning out well; but they now stand much in need of moisture, to bring them to perfection.

In Ireland and Scotland the greater portion of the crops is now secured; but we understand that the yield of oats is by no means equal to last season.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Compared with the previous month, the supplies of both home and foreign stock on offer in the Metropolitan and some of the leading provincial markets have been large. In their general quality, however, little or no improvement has taken place. The trade has been less active than for several previous months, and the quotations have had a downward tendency. The fall in prices, however, from the extraordinary position in which the cattle trade is now placed, we look upon as temporary; and our reasons for the supposition that fat stock will be dearer may be briefly stated. Evidently, *the consuming powers of some European countries, France and England in particular, have outstripped the powers of production;* and, were it not for the vast resources of Spain and Holland, it would be a serious question whether the present demand could be met at all. We have been accustomed to look upon our immense importations of stock from Holland as a sure index of agricultural depression. To an extent, they have checked production; but the high prices of the last three years, including the present season, have given a great stimulus to artificial and other means of feeding, without being productive of any increase in the supply of either beasts or sheep in this country. Again, at one period France sent us rather large supplies of stock; but she, in her turn, has found it necessary to import considerably in excess of ourselves, without reducing prices; in point of fact, meat is now much dearer in all parts of France than it is in England. In the first six months of the present year we imported, in round numbers, 70,000 head of stock; in the same time, over 200,000 head were received in France from Holland, Belgium, and Spain. This immense supply has not checked the upward movement in price. It would appear, therefore, because we have no accounts of serious losses by disease, and because price has been sufficiently high to admit of an extensive use of artificial food, that the population of most of the French provinces has become in a much better position to purchase an additional quantity of the better kinds of food than in former years. Possibly, however, the immense tracts of land in France under the culture of beet and potatoes—the former for the purpose of sugar-making, the latter for the yield of treacle—have greatly interfered with an increase in the supply of stock. We are aware that beet-culture in that country has paid extremely well; yet, as sugar is an article which may be more easily imported than beasts or sheep, and that, too, in any quantity, and without perilling the best and most vital interests of the country, it has, we find, become a matter for serious consideration in high quarters whether the present system ought to continue. We say nothing in favour of legislative interference with private interests; though the general impression appears to be that, were corn more extensively cultivated in France than it has been since 1852, cattle would increase in a fair ratio, and the prices of both would be more equalized with ours than they now are.

Notwithstanding that every means is adopted by graziers to force cattle for our markets, the stock exhibited during nearly the whole of the month has been in very middling condition; and it would appear, from the great demand and the immense consumption, that there is very little prospect of any great improvement in it. This is to be regretted, because we are quite convinced that prime *fat* animals invariably pay the grazier better than those in a half-fat state; besides which, the land loses a large amount of benefit which otherwise would result from the stock being kept a longer period upon it. The root crops are turning out well; but they now stand somewhat in want of moisture, to bring them to perfection and increase them to a full average weight.

The following returns show the importations of foreign stock into London since we last wrote:—

	Head.
Beasts	7,161
Sheep	22,744
Lambs	613
Calves	1,646
Pigs	2,266

IMPORTS AT CORRESPONDING PERIODS.

Sept.	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1854 . .	7,805	26,230	748	1,894	2,281
1853 . .	8,372	28,845	273	2,535	1,498
1852 . .	6,619	34,759	1,132	2,388	1,847
1851 . .	6,177	28,566	2,075	2,518	1,994
1850 . .	5,556	19,802	1,939	1,819	752

The total supplies, including English, Irish, and Scotch stock, shown in the Metropolitan Market have been:—

	Head.
Beasts	24,767
Cows	540
Sheep and lambs	152,120
Calves	2,477
Pigs	3,921

COMPARISON OF SUPPLIES.

Sept.	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1854	24,896	542	174,171	2,760	3,465
1853	27,063	518	157,750	3,037	3,170
1852	24,911	490	148,680	2,934	2,980
1851	23,007	600	169,390	2,220	3,447
1850	22,212	475	173,450	2,491	2,639

We have a few remarks to make respecting the arrivals of stock from Ireland. It is well known that for many years past they have been large as to number, but very deficient in quality; and that the imports were chiefly directed to the Lancashire markets. This month, however, some wonderfully fine beasts and some excellent sheep—the number of the former being about 1,000, of the latter 4,900—have arrived in the Metropolitan Market, and realized very high rates. If the sister isle can continue to produce such stock, why is not the number increased; why is it not *doubled* for a good and ready-money market like London? Fat stock is an article which *must* pay well—better, perhaps, than corn; and the Irish graziers have now an opportunity of enriching themselves, possibly at the expense of those residing in Holland.

The supplies of stock in London have been chiefly drawn from Lincolnshire, Leicestershire, and Northamptonshire, those counties having furnished 11,700 shorthorns. From other parts of England 3,000 of various breeds have come to hand; but the receipts from Scotland have been under 200 Scots.

Beef has sold at from 3s. 4d. to 5s.; mutton, 3s. 4d. to 5s.; veal, 3s. 10d. to 5s. 2d.; and pork, 3s. 6d. to 4s. 6d. per 8lb., to sink the offals. Lamb has now become out of season.

COMPARISON OF PRICES.

	Sept. 1854.		Sept. 1853.	
	s. d.	s. d.	s. d.	s. d.
Beef..... from	3 0 to	5 0	2 10 to	4 6
Mutton	3 0	5 0	3 2	5 2
Veal.....	2 10	4 4	3 6	4 8
Pork.....	3 4	4 8	3 4	5 2

	Sept. 1852.		Sept. 1851.	
	s. d.	s. d.	s. d.	s. d.
Beef..... from	2 0 to	4 0	2 2 to	3 6
Mutton.....	3 0	4 6	2 8	4 0
Veal.....	2 10	4 2	2 8	3 8
Pork.....	2 10	3 10	2 4	3 8

Compared with some former seasons, there has been a great deficiency in the supply of rough fat, which has sold at 3s. 2½d. per 8lbs. We do not expect any decided increase in it, unless, indeed, the stock should arrive in greatly improved condition.

Newgate and Leadenhall markets have been well supplied with both town and country-killed meat, and the trade has ruled heavy, as follows:—Beef, from 3s. to 4s. 4d.; mutton, 3s. 2d. to 4s. 6d.; veal, 3s. 6d. to 4s. 8d.; pork, 3s. 6d. to 4s. 8d. per 8lbs. by the carcase.

From the great expense in transmitting stock to Paris, the purchases made in London have been small; viz., about 40 beasts, and 300 sheep. It is scarcely to be expected, from the reason just assigned, that foreign buyers will come here, as purchases can be more profitably made in Holland and Spain. Hitherto Dutch stock has suited the French markets, as *fat* meat is not a necessary ingredient to a French *cuisine*.

SMUT IN WHEAT.—Our first attention was drawn to the cause of smut in wheat arising from thick sowing three years ago. A neighbouring farmer permitted us to thin a rod of his wheat by way of experiment in the month of March, which was sown at 2½ bushels per acre. Three-fourths were taken out, but did not answer our purpose fully for which it was intended, viz., it did not branch so satisfactorily as it has since done from similar proceedings if performed early in autumn, when the produce has been doubled—it did not tiller then more than the other, and only spired up one, two, and three on a stub, although it grew much finer than the rest, and produced as much, and was prominent for its dwarfness throughout the summer, and did not lodge as the other, nor hasten to ripeness for a week or fortnight later. It, however, taught us one important lesson which we never forgot, and now desire to make it known, namely, that not one smutty ear could be detected on the whole group, whilst in the main breadth at least twenty black or smutty ears could have been gathered at any part without moving a foot. The variety was rough-chaffed white, which appears more subject to smut than any other.—HARDY & SON, Seed-growers, Maldon, Essex, Sept. 18th, 1855.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABINGDON FAIR.—Of sheep there was a considerable supply, which changed hands at the improved prices obtained at late fairs. The few good cows brought into the fair sold readily at high prices. There was a larger supply of horses than sufficient to meet the requirements of buyers, the better-most sorts of which only realizing high rates. The few London horses exhibited the day before were eagerly caught up at the sellers' terms.

ASHBOURN FAIR.—There was an abundant supply of fat stock, which, it is needless to say, for as much business as was done, obtained good prices. Store stock and sheep were dull of sale, owing no doubt to the scarcity of pasturage in many districts. There were about 1,300 sheep and lambs penned.

BEDALE FORTNIGHT FAIR was almost deserted, in consequence of the great annual cattle fair at Masham being held the same day. The prices were lower than those obtained at the last market. Beef, 6s. 9d. to 7s. 6d. per stone; mutton, 6d. to 6½d. per lb.

BUCKFASTLEIGH FAIR.—There was a good supply of Cattle, but sales were exceedingly dull. Cows and calves, £10 to £12; fat sheep, 6d. to 6½d. per lb.; breeding ewes, 28s. to 30s. each. A good show of rams, at from £2 10s. to £3 10s. each. Yolk wool, 8½d. per lb.

CARLISLE FAIR.—Taken as a whole, the exhibition of cattle and lambs, particularly the latter, was unusually good, and prices ruled very high. There was a large attendance of well-known dealers, and many of our country agriculturists and tenant-farmers were present, but we did not hear of any extensive sales or purchases having been made amongst them. The show of cattle was short of last year, but was a fair average. Galloway scanty supply and moderate quality. Short-horned heifers: Top price, £18 per head; bullocks, £18 10s. Lively demand for milkers and calvers. High prices demanded. but a reduction submitted to. In quotations no change to note. Horse show tolerably good. High prices were obtained for heavy cart horses. The number of lambs shown was 12,169. Cross-bred lambs averaged 8s. to 15s. 6d.; Cheviots, 9s. to 15s.; half-breds from 14s. to 22s. 6d.; ewes from 19s. to 23s. 6d. For the better class of tups from £3 3s. to £5 10s., and £6; and secondary from £2 10s. to £2 14s.

GLOUCESTER MONTHLY MARKET.—The supply of cattle and sheep was larger than for some months past, but the quality was very inferior; the best beasts were readily sold, whilst inferior animals met a dull sale. The supply of mutton was good, and was soon disposed of. Beef from 6½d. to 7d.; mutton, 7d. to 7½d. per lb.

HOLBEACH FAIR.—There was an unusually large number of horses and foals, many of the latter (cart foals) being an improvement on the quality of former shows, and they consequently realized high prices, the highest being 20*l.* 10s. The show of good two-year-olds was considered rather small; but altogether a fair amount of business was done, at satisfactory prices to the sellers.

KELSO DRAFT EWE MARKET.—The number of ewes upon the ground was large, there being no fewer than 4,000, principally bred and half-bred, with a good many lots of three parts bred, and a few of Cheviot. The ewes were generally in excellent condition, and the day was highly favourable. There was a good attendance of buyers, many of them from distant parts; but the supply was more than equal to the demand, and many of the ewes were not disposed of, partly, however, owing to holders not accepting of the prices offered. The prices obtained for the best descriptions were the same as last year, while secondary qualities were 2s. or 3s. below last year's prices. Bred ewes brought from 40s. to 47s.; three-parts and half-bred from 33s. to 36s.

KENDAL FORTNIGHT FAIR.—There was a very large attendance of dealers, and the largest show of sheep ever seen on the ground, there being upwards of 2,000 shown, a large number of which were sold. The show of fat cattle was not very large; but prices, notwithstanding, gave way a little. Good beef sold at 6d. to 6½d.; mutton, 5½d. to 6d.; lambs, 5½d. to 6d. A fair amount of business was done amongst sheep and lambs for grazing and breeding purposes, as well as in-calvers and lean stock, at rather reduced rates.

KINGTON FAIR was one of the largest we have during the year for the supply and show of stock; the former was indeed much larger than at previous fairs at this season of the year, and the animals were remarkable for their superior quality. The supply of sheep was equal in quantity and quality to that of former years. The attendance of dealers was far more numerous than we have noticed on former occasions, everything denoting business; yet notwithstanding the abundant supply, together with its excellent quality, there was not that amount of business transacted which might have been anticipated, owing to a decline in price. A tolerable quantity, however, changed hands.

KIRBYMOORSIDE FAIR. — There was only a thin attendance, and little business was done. Milch cows were in request. In other stock little demand.

LEWES SHEEP FAIR.—There were rather more than 30,000 sheep penned, being about 6,000 less than last year. The attendance of buyers was very large, but the shortness of feed, with the prospect of a partial failure of turnips, made them at the opening of the business very reserved and cautious. The consequence was, that after a busy demand for prices, which lasted about an hour, business ruled very slack up to two o'clock, at which time the average rates were—for lambs from 15s. to 25s., ewes 25s. to 42s., and wethers 28s. to 39s., differing but very trifling from last year's prices. The sales at this time to our knowledge were, for ewes—Mr. Turner, of Chinton, 30s.; Mr. Woodman, Glynde, 37s.; Mr. Gosden, Eastbourne, 2nd lot, 32s.; Mr. Emary, 42s.; Mr. A. Denman, 35s.; Mr. Tompsett, Deans, 29s. 6d.; Mr. Saxby, Westdean, 30s. and 34s.; Mr. Waterman, 26s.; Mr. Withers, 34s.; Mr. Gorringe, Birling, 32s.; Mr. J. Saxby, 34s.; Mr. Saxby, Firle, 2nd lot, 28s.; Mr. Filder, Hodshrove, 28s.; Executors of Mr. Penfold, 39s.; Col. Payne, 35s.; Mr. Haire, 36s.; Mr. Gorringe, Firle, 29s.; Mr. Gorringe, Eastbourne, 35s.; Mr. J. Gorringe, 31s. Lambs—Mr. Gorringe, Eastbourne, 25s.; Mr. J. Gorringe, 21s.; Mr. Saxby, Rodmill, 20s.; Mr. Turner, Chinton, 23s.; Mr. Scrase, 18s.; Mr. Waterman, 23s.; Mr. J. Saxby, 25s. Wethers—Mr. Greenhill, 30s.; Mr. Morris, Ranscomb, 33s. 6d. There were a few horses and horned cattle.

LOUTH FAIR.—A considerable number of both buyers and sellers were in attendance. In beasts the trade was dull for poor stock, whilst those well up in condition realized good prices, and met with a ready sale. Beef sold for from 7s., 7s. 6d. to 8s. per stone. The remarks we have made on the beast trade will also apply to sheep. The show of lambs was of very inferior quality, and small lambs and poor toothless ewes were a complete drug in the market, but wethers and fresh drape ewes met with plenty of buyers at strong prices. Mutton realized 6½d. to 7d. per lb.

MACHYNLLETH FAIR.—There was a good supply of cattle. High prices were demanded, but sales could be effected only upon much lower rates than could have been obtained for months past. Many steers were offered at onl s per head more than they cost three months since. The supply of horses was small, and but few changed hands.

MASHAM FAIR.—The show of sheep was as large as on former years, but the show of lambs was not equal to last year; yet we learn that upwards of 30,000 animals (including both sheep and lambs) were shown. Good mutton sold from 6½d. to 7d. per lb. Mr. Matthew Imeson, Low Ellington, obtained the highest price of any farmer in the parish for

twenty fat wethers—namely, 61s. each. Mr. John Kendall, Warren House, and Mr. Chas. Lee, High Ellington, each showed a pen of very fine sheep. There was a scarcity of buyers on the whole, which caused a large number to remain unsold until a late hour. The beast fair was well attended, high prices were realized, and a great many sales were effected. Good beef was scarce, and farmers were asking 8s. per stone, which in many instances they obtained without difficulty. Mr. John Lightfoot, of the Howe and Sutton Farms, showed 50 very fine bullocks, which were all sold, and made the top price in the market. There were not so many of the lean kine and half-bred shown as on former years.

MIDDLESMOOR FAIR.—An excellent supply of stock, which, for quantity and quality, far exceded those of previous years. Bullocks, £8 to £12 12s.; lambs, 10s. to 14s. 6d. each. The number that remained unsold was exceedingly small. A quantity of Scotch wool was also sold. The attendance of dealers and graziers was numerous.

MOFFAT TUP MARKET.—The stock was rather under an average, and the quality hardly so good as last year. It was principally composed of Cheviots and a few Leicesters. There was a great number of buyers, and the young stock was very readily picked up at prices equally as good as last year; but the older sheep, with the exception of a few lots, were all but unsaleable, being rather in indifferent condition—so much so, that even the fleshers would hardly look at them. At the close of the market a very considerable number of this kind remained unsold. The prices were from 35s. to £3, and up to £5, and a few were disposed of at from £7 to £9. Although this is not a stock market for ewes, a very considerable number amongst known stock changed hands to-day, at prices equally as good as those obtained at recent markets.

MUIR OF ORD SEPTEMBER MARKET.—The market is scarcely less important for crock ewes and lambs than for cattle, and on this occasion the number of sheep brought forward could not have been less than from 9,000 to 10,000. The number of cattle was upwards of 2,000. The market was on the whole a stiff one, but less so for cattle than for sheep. Good crosses were much in demand, and the best lots were eagerly bought up on Wednesday. Highland stock hung upon the market, and at a late hour this evening large numbers were still unsold. The price of cattle was well maintained, two-year-old crosses fetching as much as £16 a-head, and three-year-old Highlanders no less than £12. Sheep were a drug. Good crock Cheviot ewes sold at from £18 to £21 per clad score, and many of the farmers present sold stock of the same kind and quality at the Inverness Fair at from £2 to £3 per score higher. Lambs were much down, some of the sales showing a decrease of as much as from £3 to £4 per clad score on the prices of Inverness. A large proportion of the sheep exhibited was unsold at a late hour this evening. The cause of the decrease in lambs is said to be, that for the last three or four years buyers have not profited by the lambs which they purchased at the prices then current, and are now more cautious in their speculations. As regards ewes, the south is said to be already well stocked, and can compete with the north, while they save the cost and risk of driving. The cattle shown was to a large extent of the West Highland breed, and not very good of the kind. The sales effected in this stock were five per cent. better at the commencement than at the close of the market.

NORTHAMPTON FAIR.—Fat sheep were in short supply; best wethers made from 4s. 4d. to 4s. 8d. per 8lbs., and fat ewes from 3s. 8d. to 4s. Of fat beasts there was rather a large show; best fat beef made from 4s. 6d. to 4s. 8d. per 8lbs.; inferior sorts considerably less. Great numbers of store sheep were brought, and good things sold readily at about former rates; but middling sorts hung heavily on hand, and lower prices had to be submitted to. In lambs but very little done. There was a very large show of superior tups. Some very fine thorough-bred Leicesters were brought by Mr. N. Jones, of Boughton; and some well-bred sheep by Mr. Ward, Drayton, near Rockingham; Mr. Manning, of Orlingbury, &c. The supply of store beasts was large of all descriptions, but trade was by no means brisk. New milch cows were scarce, and a flat trade. The horse fair was well supplied with useful nags, colts, ponies, &c.; good horses sold readily, but in other sorts little was done.

PAINSWICK FAIR was well attended. Nearly 400 sheep were penned, the whole of which were nearly sold, as were also several horses, beasts, and pigs.

PARTNEY FAIR was most numerously attended. Nearly 40,000 sheep of different descriptions were penned. A large number of buyers, many of them from distant places, were also present. Nevertheless, owing to the abundant supply, the trade ruled somewhat dull, and in many cases prices were the turn lower. The best lambs, sheep ready for the butcher, good young ewes (whether intended for feeding or for tupping) and shearing wethers, sold well; but many inferior animals remained unsold at the close of the fair. We heard of one lot of drape ewes being sold by Mr. Allison, of Great Steeping, at 53s. 200 ewes, which had brought up lambs this season, the property of Mr. Vessey, were sold before the fair at 60s. The ram sales, as was expected, attracted great attention.

SHREWSBURY FAIR.—Beef made 6d. to 6½d.; veal, 6d.; wether mutton, 7d.; and bacon, 5½d. to 6d. Stores, oxen, and barrens realised fair prices; store sheep and store pigs made very good figures.

WALTHAM FAIR took place at Walton-on-the-Wolds, near Melton Mowbray. The show of stock was not quite so large as on some former occasions, and the business done was at a reduction in prices in all kinds of stock. The horse fair was pretty well attended, and good ones realized their full value.

YORK FORTNIGHT MARKET.—Mutton sheep were in good supply, but they had slow demand, at 5d. to 5½d. and 6d.—wethers and gimmers, light weights, 6¼d. per lb. Grazing sheep, lambs, and tupping ewes from the north, being the first of our autumnal markets, was only moderate in supply, yet fully equal to the demand, at prices tending downwards. Fat beasts were in greater supply than demand: inferior kinds, 6s. 6d. to 6s. 9d.; prime ones, 7s. per stone. All kinds of lean beasts were plentiful, and prices lower. Calving and dairy cows had slow sale, at rates heavy upon last market.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF SEPTEMBER.

The month of September opened with cold bracing weather, the wind prevailing then mostly from the north-east; the temperature during the first week was much lower—down to 57 degrees, whilst in the last week of August it averaged 64 degrees, and the last part of September was much warmer than the first: on the whole a finer month has not been experienced for many years, and harvest work has only been checked two or three days, and has progressed most favourably, the corn going up in better condition than that which was secured at the commencement of harvest; but in spite of this, there have been considerable fluctuations, and as the markets had given way under the unfavourable weather previously, against the usual course of trade when wet falls during the

reaping of grain, so when the fine weather set in, markets improved, and continued to advance until the first good supply of new wheat for the season appeared at Mark-lane, and then the decline was only temporary, and lasted but one market day, for an increased French demand set in, and large sales were effected for shipment along the coast, to meet the emergency of the Parisian market at a period of no little excitement and alarm.

The supply of English wheat at the first Monday's market of the month in Mark-lane was short, and samples of new met a brisk sale at 1s. to 2s. per qr. over the rates of the previous week, there being much less of this year's growth than was generally expected, and the town millers were anxious to obtain small parcels, to give a freshness and novelty to their flour; whilst for old, full prices were paid, although the demand was not so brisk; the top quotations of red was 80s. per qr., and of white 87s. per qr. There was a moderate demand for foreign wheat, and no quotable change occurred in the value of any description: fine Dantzic commanded 88s. per qr., and select Pomeranian red 82s. per qr., other sorts in proportion. The imports consisted of 1,330 qrs. from Alexandria, 222 qrs. from Constantinople, 850 qrs. from Dantzic, 1,296 qrs. from Konigsberg, 850 qrs. from Rostock, and 1,600 qrs. from Smyrna, making a total of 6,148 qrs., against 10,921 qrs. the corresponding week of last year. The London average registered 75s. 10d. on 4,024 qrs. The weekly average was 73s. 7d. on 79,282 qrs., against 63s. 7d. on 58,555 qrs. the corresponding week of last year. During the previous week the weather was of a very favourable character, and much harvest work was completed in good order: so fully occupied were the farmers that they have not had time to thrash out any quantity. The entire supply of new was only about 1,200 qrs.; whilst on the corresponding Monday last year, 5,000 qrs. could have been purchased in Mark-lane, the top price of choice red being then 50s. per qr., and of very fine white 56s. per qr.; and from that point prices rapidly advanced, and attained in a short period the prices named, as the top value this year—80s. for red, and 87s. for white.

The supply of English wheat at Mark Lane the second Monday of the month was very moderate, and new samples met a brisk demand at an advance of fully 2s. per qr. generally: choice samples adapted for seed commanded a greater enhancement—there being a good sale for approved descriptions to export to France, Belgium, and the Baltic, whilst samples of old English realized 1s. to 2s. per qr. more money. The top price of red was 82s. per qr. and of white 89s. per qr. A fair extent of business was transacted in foreign wheat at 2s. per qr. over the currency of the previous Monday. The stocks are being much reduced, and are now very low; prices generally much higher than those of English. The imports consisted of 150 qrs. from Bandholm, 420 qrs. from Bremen, 760 qrs. from Burger Tief, 5,580 qrs. from Dantzic, 13 qrs. from Douer Odde, 425 qrs. from Greifswald, 250 qrs. from Landscrona, 10 qrs. from Marstand, 670 qrs. from Memel, 100 qrs. from Norkoping, 242 qrs. from Pillau, 525 qrs. from Randers, 1,168 qrs. from Rostock, 4,232 qrs. from Stettin, and 563 qrs. from Stockholm, amounting to 15,108 qrs., against 1,370 qrs. the corresponding week of last year. The London average registered 78s. 11d. on 5,601 qrs. The weekly average was 72s. 7d. on 72,088 qrs., against 62s. 3d. on 56,924 qrs. the corresponding week of last year. A most splendid week for harvest work was experienced, the wind prevailing mostly from the north-east, and blowing briskly nearly the whole week, and a great breadth of land was cleared, all corn going up in the finest order possible.

An increased quantity of wheat was brought forward at Mark Lane the third Monday of the month, and the deliveries in all the agricultural districts at the close of the past week being larger, combined with a rather worse condition, owing to the dampness of the morning, caused the town millers to purchase with a degree of carelessness not yet visible since new samples appeared, the result was a giving way in the general value of new samples to the extent of about 2s. per qr. on the average sales effected, and these were only to a very limited extent, some considerable portion of the supply being left over unsold for future markets. Qualities of old were unvaried in value, and the humidity of the atmosphere seemed to cause more desire to purchase the finer qualities, and holders were pretty firm in their demands for such. There was no alteration in the value of foreign samples, but only a limited extent of business was transacted therein. The imports consisted of 1,490 qrs. from Dantzic, 60 qrs. from Konigsberg, 660 qrs. from Norkoping, 210 qrs. from Oporto, 2,400 qrs. from Ragusa, 2,295 qrs. from Saffee, 2,400 qrs. from Seville, 800 qrs. from Smyrna, and 1,071 qrs. from Stettin, making a total of 11,386 qrs., against 2,470 qrs. the corresponding week of last year. The London average registered 80s. 9d. on 5,739 qrs. The weekly average was 74s. 10d. on 79,282 qrs., against 59s. 4d. on 59,121 qrs. the corresponding week of last year. For a few weeks before seed-time commences the deliveries will increase, although we think if prices give way a little more the farmers would prefer to thrash barley.

A large supply of new wheat was brought forward the fourth Monday in Mark Lane from Essex

and Kent, some portion of which consisted of samples left over unsold from the arrivals of the previous week; and, although at the opening of the market, factors demanded higher prices, on account of the numerous sales which had been effected for exportation to France in the middle of the past week, yet that demand having materially slackened, nearly the whole of the supply was left for the town millers, who again acted on the reserve. A few early sales were made of prime red qualities at nearly the prices of that day se'nnight, but late in the day the runs were disposed of at a reduction of 2s. to 3s. per qr. The runs of Essex were reported to have been sold at 82s. per qr. Selected samples of red commanded 80s. per qr., and of white 86s. per qr. Fine old qualities were not sold at any material reduction, as those millers who make a prime sack of flour cannot accomplish this without an admixture of such. Foreign wheat was held on former terms, and choice Dantzic white brought as high as 96s., and selected Rostock 92s. per qr.; other descriptions of red down to 80s. per qr., as in quality. The imports were limited, and consisted of 3,250 qrs. from Alexandria, 650 qrs. from Anclam, and 1,550 qrs. from Enos, making a total of only 5,450 qrs., against 4,745 qrs. the corresponding week of last year. The London average registered 82s. 6d. on 4,651 qrs. The general average was 76s. 9d. on 97,377 qrs. The corresponding week of last year was 52s. 5d. on 70,127 qrs. This was the lowest return on the entire year of 1854, and from that point prices advanced rapidly, and by the 25th of November touched 74s. 7d. per qr. with 126,455 qrs. returned.

There have been numerous fluctuations in the article of flour throughout the month, and large sales of Spanish have been made for export to France, both from the ports of London and Liverpool; the stocks having thus been much reduced. The arrivals coastwise the first week of the month were 1,070 sacks, by Eastern Counties Railway 6,538 sacks, by the Great Northern 877 sacks, from foreign ports 2,182 sacks. The top price of town-made was 70s., households 62s. to 63s., country marks 58s. to 60s., Norfolks 55s. to 56s., Spanish 59s. to 60s. per sack. The arrivals the second week were 2,242 sacks coastwise, 8,993 sacks by the Eastern Counties Railway, 962 sacks by the Great Northern, and 4,512 sacks from foreign ports. The nominal top price of town-made was put up 2s. per sack, and all choice country marks advanced as much; and Norfolks were held at 58s., and 57s. refused; Spanish made 61s. to 63s. per sack. The arrivals the third Monday consisted of 1,980 sacks coastwise, 7,664 sacks by the Eastern Counties Railway, 1,880 sacks by the Great Northern, 3,309 sacks and 600 barrels from foreign ports. The trade was healthy: the top price of town-made was 72s., households 65s. to 66s., Norfolks 59s. to 60s., and Spanish 65s. per sack. A large business was transacted in the last description, entirely for exportation to France; and the stocks are now much reduced, with no prospect of any material increase in the imports of this sort, as shipments are now made direct from Spain to France. The arrivals the third week consisted of 799 sacks coastwise, 9,252 sacks by the Eastern Counties Railway, 2,137 sacks by the Great Northern, and 812 sacks from foreign ports. There was a steady demand for all fine qualities, at full prices generally; and the demand for Spanish continuing for France, this description reached 66s. per sack; and Norfolks were held at 60s. by some parties, and sold at 59s. 6d. per sack by others.

From the continued busy occupation of the farmers, the deliveries of barley have been very moderate throughout the month; and imports have continued on a limited scale, on the whole. The arrivals the first week were 125 quarters coastwise, 64 quarters by railway, 290 quarters from Ireland, and 477 quarters from foreign ports. An enhancement of 1s. per quarter was obtained on all descriptions. The arrivals the second week consisted of 462 quarters coastwise, 82 quarters by railway, 6 quarters from Scotland, but the imports of foreign were 13,477 qrs; and again an advance of 1s. per quarter was paid on all sweet useful parcels. The arrivals the third week were very trifling of all descriptions, and consisted of 108 quarters coastwise, 322 quarters by railway, 6 quarters from Scotland, and 573 quarters from foreign ports; and select qualities were again 1s. per quarter dearer, with a good deal of inquiry for new malting samples, which have yet been brought out in very small quantities; and the distillers have obtained little of this year's growth, but have contrived to take the freshest parcels of Danish, paying up to 37s. per quarter for such; and on these sorts they are likely to commence making malt under the new act, which enables them to do so without paying duty thereon, but only 2d. per gallon on the spirit. This will be a boon to the agriculturists, and enable them to obtain good prices for barley; and many of them are determined to thrash this article freely, and in preference to wheat, more particularly when the trade for the latter article flags a little. The arrivals the fourth week consisted of 763 quarters coastwise, 132 quarters by railway, and 530 quarters foreign. There was much inquiry for choice malting qualities of new, and poor supplies of all sorts; a further advance of 1s. per qr. was established, and one choice lot of Chevalier brought 43s. per qr. The averages since last publication have

been 34s. 5d. on 3,684 quarters, 34s. 9d. on 3,514 quarters, 35s. on 3,837 quarters, and 35s. 3d. on 4,777 quarters.

The arrivals of English and Scotch oats throughout the month have been of the most trivial character, and the supplies of Irish have been moderate; but now and then there have been large imports of foreign to make up the deficiency of our own growth. The arrivals the first week were 500 quarters by railway, 14 quarters from Scotland, 3,999 quarters from Ireland, and 16,935 quarters from foreign ports—making a total of 21,448 quarters. There was a tolerably fair demand for all descriptions, and choice sweet corn commanded 6d. per quarter more money, both dealers and consumers taking off a fair quantity. The arrivals the second week were 415 quarters coastwise, 874 quarters by the Eastern Counties and Great Northern Railways, 403 quarters from Scotland, but no Irish; whilst the imports of foreign were immense, amounting to 51,446 quarters. But notwithstanding this very great supply, the condition of the foreign cargoes is so excellent—from the very short voyages of all vessels from the North of Europe—that the buyers of every description took this article freely; and, as is often the case when they have been waiting for supplies, they paid an advance of 6d. to 1s. per quarter on all choice corn. The sales effected were to a very large extent, evidently indicating that the dealers have allowed their stocks to go down very low, and that the factors do not hold many; and until the new crop comes forward liberally, prices appear likely to be well supported, and the bulks of old will be nearly exhausted. The third week, supplies [of all descriptions fell off considerably. From our own coast there were only 137 qrs., by the Eastern Counties Railway 465 qrs., by the Great Northern 382 qrs., from Scotland none, from Ireland 1,900 qrs., and from foreign ports 10,521 qrs.; making a total of 13,405 qrs. A steady and moderate business was transacted in the better qualities, and fresh heavy corn commanded an advance of 6d. to 1s. per qr., consumers and dealers both taking off a fair quantity; and the sales were, on the whole, larger than the imports of the week. For the fourth Monday of the month a somewhat singular circumstance occurred with respect to this article: having no arrivals coastwise, and none from Scotland, only 204 qrs. by the Eastern Counties Railway, 127 qrs. by the Great Northern, but 3,716 qrs. from Ireland, and 3,598 qrs. from foreign ports; making a total of 7,645 qrs. In consequence of the shortness of the supply, more money was generally demanded. The trade, however, was not brisk; the buyers, having so little choice, preferred to wait for an increased quantity, and the advance established was only 6d. per qr. on the choicest heavy and sweet parcels. The great bulk of the supply during the month has been from Denmark and Sweden.

There have been very limited deliveries of beans during the month, and good samples of English have brought enhanced prices, with a ready sale for all prime qualities. The arrivals of English the first week were only 75 qrs; but of foreign there were 932 qrs., and 41 qrs. by rail. The second week the arrivals coastwise were 66 qrs., and by rail 97 qrs., but of Egyptian 1,813 qrs.; and prices were generally rather higher, with a good demand. On the third Monday there were 199 qrs. coastwise, 27 qrs. by rail, and 1,350 qrs. foreign: an advance of 1s. per qr. was fully obtained. There were 91 qrs. coastwise the fourth week, 27 qrs. by rail, and only 200 qrs. foreign; and somewhat higher prices were again obtained for all sorts. At the outports the arrivals from Egypt have been moderate; and prices have advanced within the month rather more both at Liverpool and Glasgow than in London, some cargoes having been placed for investment, in the expectation of still higher prices being obtained from the tendency upwards of all feeding stuffs. The averages of the month have been 46s. 4d. on 2,290 qrs., 46s. 9d. on 2,205 qrs., 47s. 10d. on 2,014 qrs., and 48s. on 1,862 qrs.

The article of peas had been completely exhausted before new samples were brought to market, and prices set in with the first few deliveries at very little over the value of old samples. The first clay-coloured which were sold brought 38s. to 40s. per qr., and before the month closed these commanded 44s. per qr.; and white samples have been run up at least 1s. per bushel, as the quantities brought forward have yet been so very trifling, and the demand is setting in pretty early, all buyers being out of stock; and the consumption has commenced on the new crop in good earnest. There is now every prospect of very high prices during the winter months, as we shall be thrown on our own resources from the failure of crops in Germany and Pomerania, as well as in Prussia. Our supplies are, therefore, likely to be very limited during the winter months, and our farmers will be remunerated for the growth of this article the present year; but we believe that only a moderate breadth was sown. The averages of the month have been 40s. on 340 qrs., 38s. 8d. on 534 qrs., 39s. 4d. on 939 qrs., and 43s. 5d. on 595 qrs.

The imports of foreign grain for the month ended the 31st August, as published in the *London Gazette* of the 14th September, were 583,192 qrs. grain and 132,046 cwts. flour, against 522,742 qrs. grain and 228,213 cwts. flour the corresponding month of last year, and the different sorts stand thus, viz.—

	1854.		1855.
Wheat....qrs.	198,057	....	251,860
Barley	96,759	....	41,080
Oats	125,069	....	125,088
Rye	441	....	423
Beans	5,079	....	25,830
Peas.....	34,490	....	5,880
Maize	62,847	....	132,960
Brank	——	....	71
Total	522,742	....	583,192
Flour....cwts.	228,213	....	132,046

It will be observed, by the above table, that the imports of wheat were considerably in excess during the month of August to those of the previous month, the Baltic shipments then having come in freely; but the next return will reverse this, and until the imports from America begin to increase, we look for a great falling off from other quarters of the globe, unless a considerable number of vessels, which have left the Danube for naturalization to other ports, come in and render some assistance during the month of October. This is probable; but the highest bidder will be the buyer, and many cargoes may be lost to England.

The markets in the North of Europe are all very high, with exhausted stocks, and in some countries a very unfavourable harvest, and miserable quality of wheat. At Danzig the samples of new range from 49 to 54lbs. per bushel, and fine old descriptions have consequently commanded very high prices, up to 93s. per qr., the whole disposable stock having been reduced to 7,000 qrs., and some quantity has been bought for the interior; from thence England can expect little assistance this season. At Stralsund prices of parcels fit for seed are extremely high, varying from 83s. to 100s. per qr., as in quality, and the crops are considered of a very deficient character, yielding in general about half the average quantity of ordinary seasons. The best rye weighs 57lbs., being a good weight for that country's growth; but the yield is reported to be very defective. Barley has proved a moderate crop, and weighs as usual about 52lbs. per bushel. At Hamburg 60½ to 61lbs. red Mecklenberg wheat commanded 84s. to 85s. per qr.; new 58½lbs. Rostock, 79s. 6d. At the outports a continued demand is experienced for wheat: Danish and Holstein samples changed hands at 80s. to 81s., and for 60 to 60½lbs., from the east coast of Holstein, 81s. to 82s. per qr. were the prices paid free on board. Large transactions have taken place in barley from the outports: 6,000 qrs. have been sold for autumn, and fully 8,000 qrs. for spring shipment—53 to 54lbs. Jutland realized 38s. 9d., and 53 to 53½lbs. Danish 38s. 6d. to 39s. 6d., and for new 47½ to 48lbs., for October shipment, 33s. 6d. to 34s. 6d. per qr. In Holland very high prices are current, and likely to be throughout the winter months: 62¾lbs. old Guelder red wheat has brought 96s. 6d.; 62¼lbs., 95s.; new 62¾lbs., 93s. 6d.; year-old Rhenish 59lbs., 87s. 6d.; Danish 59lbs., 85s. 6d. per qr. Good Archangel rye was held for 58s. per qr.

The Belgian markets are very high, although for some time they have been of a dull character; now, however, they have awakened from their lethargy; and at Antwerp fine qualities of red wheat have commanded 84s. to 85s. per qr., white 81s. to 82s., the quality of this description not being so fine as the former. Barley has brought 37s. to 38s. 6d. per qr. free on board.

In Spain much wheat remains in the fields, some uncut and some in the sheaves, for want of labourers, and owing to the deplorable effects of the cholera. Usually in that country the process of thrashing is effected out of doors, and it is necessary to have hot dry weather during the harvest; but this year it has been quite the contrary, and heaps of sheaves were exposed to heavy rains, experienced for several days. At Santander prices of both wheat and flour had advanced; there is no stock of either for present delivery, and 79s. per qr. of 480lbs. had been refused for new white wheat, deliverable in November and December. First flour, deliverable in October and November, could not be obtained under 60s. to 60s. 6d. per sack, seconds 55s. per sack of 280lbs.

The greatest excitement has existed throughout the month, in France, on account of their harvest turning out deficient, after a considerable rise. We left the price of flour at Paris, in our last "Review," 100 francs per sack of 159 kilos., equal to about 66s. per sack of 280lb., for delivery immediately, and at 94 to 95 francs for distant delivery, with the stock reduced to 7,574 quintals. Such has been the continuous and rapid rise since of the article, that 118 francs had been attained per sack of 159 kilos., for immediate delivery, equal to about 78s. 6d. per sack of 280lb.; and 102 francs, or about 68s. per sack, for distant delivery; and on the 21st September the stock was reduced to about 4,666 quintals, and from that point the daily sales, arrivals, stocks, and prices will cease to be officially announced, until the end of every fortnight. The buyers and sellers have thus been thrown into difficulty; and at this moment trade is in a complete state of stagnation, in consequence of this sudden change and determination on the part of the French Government. The markets generally have been scantily supplied with wheat, and prices have steadily advanced; and common runs of new French red reach 77s. to 78s. per qr. France is supposed to produce annually 82 million hectolitres of wheat; and supposing this year's harvest to have yielded 75 million, there will be a deficiency

of seven million. Government is, consequently, very anxious to see this quantity secured, and has given every encouragement to merchants to purchase it in the lowest markets of the whole world; and to effect this, a host of French buyers has left for the United States some time back; and the next advices from thence will no doubt intimate their commencement of business in good earnest.

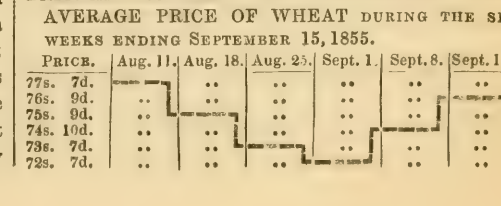
Notwithstanding the boasted superabundance of American produce, the market at New York has improved both for wheat and flour, even before the numerous French buyers have arrived out to make a beginning. The advices dated the 11th September state that flour was in good demand, at 62½ to 75 cents per barrel advance, having recovered nearly the whole of the decline of the previous week. Wheat was 10 to 15 cents per bushel of 60lb. higher, the transactions being almost exclusively in Southern descriptions. From the Western States little was expected until October. Indian corn had advanced 3 to 4 cents per bushel. Freights were higher—2s. per barrel for flour, and 5d. to 6d. per bushel for grain, to Liverpool. The transactions embraced 8,000 to 10,000 barrels of flour, including common brands to choice state at 7 d. 50c. to 7 d. 75c., and fancy to extra brands at 7 d. 75c. to 8 d. 50c., Western mixed to choice and extra brands at 8 d. to 8 d. 62½c. Included in the sales were 1,000 barrels of common Ohio, deliverable in November, at 8 d. 50c. Canada was quiet. Small sales were reported at 8 d. 50c. Southern was firmer for common grades: sales were 800 to 900 barrels, at 8 d. 12c. to 8 d. 75c. for mixed to choice, and 8 d. 75c. to 9 d. 75c. for fancy to extra brands. Nothing passing in rye-flour. Indian corn meal was firm, at 4 d. 75c. asked for New Jersey, and 5 d. 12½c. for Brandywine. There was more doing in wheat: the sales of Southern amounted to 15,000 bushels, including red, at 1 d. 80c. to 1 d. 85c., with some handsome lots quoted at 1 d. 90c., and white at 1 d. 90c. to 1 d. 95c.; and 1,000 bushels mixed sold at 1 d. 90c. A sale of 7,000 bushels new Genessee white—the largest lot of the season—was made, for milling, at 2 d. per bushel.

With very little exception the weather has continued throughout the month of the most favourable character, and harvest-work progressed rapidly—the principal check being want of labourers in some districts; and at the close of the month there were patches of grain yet to be secured. It will require up to the middle of October to make a complete finish, but nothing of moment is left; and from the fine order in which the grain has gone up for more than a month, all will be available for consumption—not a sprouted corn to be met with. That portion secured in August is in many instances soft, and ought to be kept in the stack until after the penetrating winds of March.

With respect to the yield of wheat we adhere to the opinion expressed in our review for the past two months, that it will be barely an average as to quantity; and we are confirmed in this by the few harvest reports we have already received. One highly-respectable firm stated on the 20th of the month, for the counties of Essex and Kent, that "they feared it must be considered fully one-eighth short;" and another, for Norfolk, the same date, considered "wheat on the light lands very deficient, but on the better soils and more sheltered spots the growers reap a full average." The dry weather lately experienced will have saved many potatoes from the disease with which the haulm had been attacked; and this esculent is now coming forward liberally in good condition, and the Yorkshire Regents appear to be of a splendid quality—a very important circumstance for the country at large. The crop of barley will be a good one on the whole as to quantity, but much of very inferior and coarse quality; and for the first two months of the season there will be a run on this article, which the farmers will do well to meet by thrashing freely: every sort will be wanted—fine for the distillers and maltsters, as both these parties will be competitors for such, from the former being allowed to make malt free of duty from the 1st of October, paying only 2d. per gallon on the spirits. Oats will prove a moderate crop. Beans below an average. Peas not so much as usual grown, and a moderate yield. Turnips would be much improved by a fall of rain.

England is now so far safe as to have secured as good crops as any part of Europe, and we are already called upon to supply our neighbours the French with both our own wheat and Spanish flour. Purchases have also been made for Belgium and for the north of Europe; and fairly having espoused free trade, we cannot, like some kingdoms, resort to stopping the exportation of grain, and must therefore go on in the course pointed out. An eventful year is in prospect for our agriculturists, as well as the trade generally: consumption alone will work wonders, and bold and spirited indeed must be that merchant who enters into purchases at the present high prices by way of investment!!

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING SEPTEMBER 15, 1855.



COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1854.	Qrs.	Av. s.	d.
Wheat....	97,377 ..	76	9	Wheat....	70,127 ..	52	5
Barley....	4,777 ..	35	3	Barley....	3,928 ..	29	2
Oats	6,503 ..	28	6	Oats	7,438 ..	25	11
Rye.....	777 ..	45	3	Rye.....	637 ..	36	11
Beans....	1,862 ..	48	0	Beans....	643 ..	45	10
Peas	595 ..	43	5	Peas	676 ..	36	10

PRICES OF SEEDS.

BRITISH SEEDS.

Coriander (per cwt.) ..... 20s. to 24s.
Carraway (per cwt.).... new 40s. to 44s., old 40s. to 44s.
Canary (per qr.) ..... 56s. to 63s.
Hempseed (none) ..... 00s. to 00s.
Linseed (p. qr.) sowing .. s. to .. s., crushing 72s. to 79s.
Linseed Cakes (per ton) ..... £12 0s. to £12 10s.
Rapeseed (per qr.) ..... new 86s. to 90s.
Ditto Cake (per ton) ..... £6 10s. to £6 15s

FOREIGN SEEDS, &c.

Hempseed, small, (per qr.) 48s. 50s., Ditto Dutch, 54s.
Coriander (per cwt.) ..... 15s. to 20s.
Carraway ..... 36s. to 38s.
Linseed (pr qr.) Baltic, 71s. to 74s.; Bombay, 75s. to 78s.
Linseed Cake (per ton) ..... £11 10s. to £13 10s.
Rapeseed, Dutch ..... 80s. to 84s.
Rape Cake (per ton)..... £6 10s. to £6 15s.

HOP MARKET.

BOROUGH, MONDAY, Sept. 24.

Our market to-day has been active, with a good demand for coloury samples at about the annexed quotations.

Mid and East Kents ..... 76*s.*, 90*s. to* 120*s.*
Weald of Kents ..... 75*s.*, 80*s.* „ 90*s.*
Sussex Pockets ..... 75*s.*, 80*s.* „ 84*s.*
Country Farnhams and Farnhams 84*s.* „ 105*s.*

Duty, £300,000.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

MONDAY, Sept. 24.

Since our last report there has been a considerable decrease in the arrivals of potatoes from most quarters. To-day the supply was very moderate, and the demand was steady, as follows:—York Regents, 75s. to 80s.; picked samples, 85s. to 90s.; middlings, 45s. to 55s.; shaws, 70s. to 80s. per ton.

ENGLISH BUTTER MARKET.

LONDON, September 24.

For fine Butter, in English, there is a steady demand; but middling and inferior parcels are neglected.

Dorset fine ..... 108*s. to* 110*s. per cwt.*
Do. middling ..... 96*s. to* 98*s.* „
Devon ..... 100*s. to* 102*s.* „
Fresh ..... 11*s. to* 13*s. perdoz.lbs.*

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	*Cheese, per cwt.*	s.	s.
Friesland	104 *to*	106	*Cheshire*	*new* 66 *to*	80
Kiel	100	106	*Cheddar*	„ 70	84
Dorset, new	108	112	*Double Glouces.* „	66	76
Carlow	100	104	*Single do.* .. „	60	70
Waterford	94	102	*Hams, York*	84	94
Cork, new	96	104	*Westmoreland.* „	80	90
Limerick	90	98	*Irish* ..... „	74	84
Sligo	94	102	*Bacon, Wilts., dried..*	78	82
Fresh, per doz. 11s. 0d.		13s. 0d.	*Irish, green*....	71	73

BELFAST, (Friday last.)—Butter: Shipping price, 96s. to 102s. per cwt.; firkins and crocks, 10d. to 11d. per lb. Bacon, 58s. to 64s.; Hams, prime, 84s. to 90s., second quality, 66s. to 70s. per cwt.; prime mess Pork, 92s. 6d. to 95s. per brl.; beef, 105s. to 140s. per tierce; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 62s. to 64s. per cwt.

WOOL MARKET.

BRITISH WOOL TRADE.

MONDAY.—Although money is comparatively dear, and we shall have public sales of colonial wool next month of over 30,000 bales, there is a better feeling in our market, and prices are firmly supported. The quantity of wool of home growth on sale is small, though fully equal to the present demand.

	s.	d.		s.	d.
Down tegs	1	0½ to	1	1½	
Do. ewes.....	0	11 —	1	0½	
Half-bred hoggets	0	11½ —	1	1	
Do. wethers	0	11 —	1	0	
Kent fleeces, mixed	1	0½ —	1	1	
Leicester fleeces.....	0	11½ —	1	0	
Combing skins	0	10½ —	1	1	
Flannel wool.....	1	0 —	1	2	
Blanket wool.....	0	8 —	1	0	

YORK WOOL MARKET, Sept. 20.—We had only a small supply, chiefly in Moor wools, with but few buyers. Prices ruled rather heavy, and several lots unsold.—*Yorkshire Gazette.*

LIVERPOOL WOOL MARKET, SEPT. 22.

SCOTCH WOOL.—In home Wools the tone of the market in general has been rather quiet, and purchases are chiefly made for immediate requirements. Cheviot Wools alone have commanded much attention, being suitable for army clothing.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs. ..	9	6 *to*	10	3
White Highland do.	13	6	14	0
Laid Crossed do..unwashed	12	0	13	6
Do. do..washed	13	6	15	0
Laid Cheviot do..unwashed	14	6	16	0
Do. do..washed	16	6	19	6
White Cheviot do..do	24	0	28	0

FOREIGN WOOL MARKET.

The public sales of colonial wool are expected to begin on the 18th proximo, and a fair quantity will be offered, judging by the arrivals up to this date, which are about 35,000 bales. The prices of colonial samples are steady, although there is not much doing. Of continental wools the supply is rather limited as regards Germany. The manner in which the auctions will go off must depend much upon the cheapness or dearness of money next month, and, as upon former occasions there has been a favourable alteration while the sales were in progress, and prices have received a stimulus, so, it may be hoped, will there be more confidence between this date and the commencement of the series.

There are accounts this week to June 23, from Sydney, and June 30 from Melbourne.

The Sydney *Empire* says:—"The wool season is now drawing nearly to a close, and although good prices were obtained by Mr. Ebsworth, of Mort and Co., at to-day's sale, yet there was an evident flatness in the market. Well got up skin-wool realized 16¾d.; low and medium wools, from 13d. to 15d. Some damaged New Zealand wool was sold at from 7d. to 1s. 1d. The trade being very bare of tallow, this article for home consumption realized the most extraordinary figure of £61 5s. per ton. Hides also, for present use, 13s. 3d. Another important feature in the day's sale was the purchase of sheep-skins for exportation; they went at extreme rates, £13 3s. Mr. Ebsworth announced that freight to England for wool was 1d. per lb."

Freight of wool at Melbourne was ⅝d. per lb.

BRESLAU WOOL REPORT, Sept. 21.—During the last fortnight about 3,000 cwt. have been sold, consisting of—

Russian comb wools.....	at 65 to	68 Th.
Russian cloth wools	72 to	78
Silesian fleeces	98 to	100
Ditto ditto low	82 to	84
Lambs	80 to	100
Posen fleeces	80 to	85
Polish fleeces.....	78 to	80
Short skins.....	46 to	50
Long skins.....	60 to	68
Sterblings, in bundles	75 to	80

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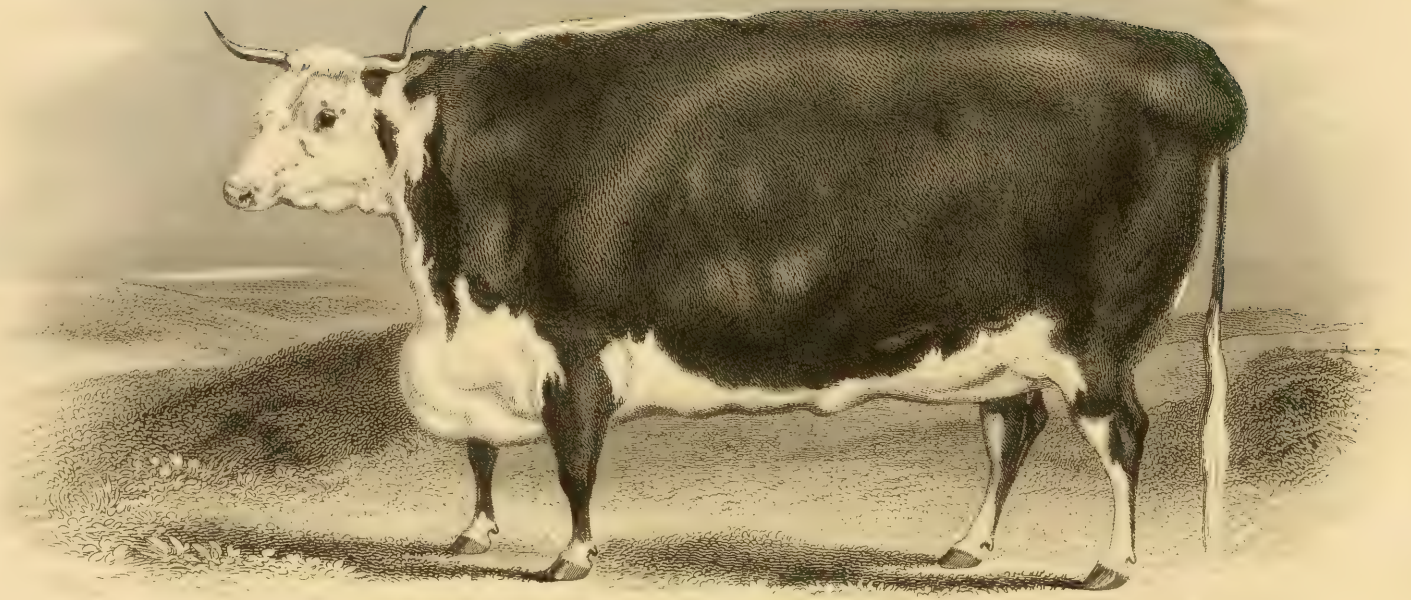


THE FARMER'S MAGAZINE.

NOVEMBER, 1855.

PLATE I.

A HEREFORD COW.

THE PROPERTY OF WILLIAM STEDMAN, ESQ., OF BEDSTONE HALL, NEAR LUDLOW.

The above animal, bred from Mr. Stedman's own stock of Herefords, the result of sixty years' breeding on the same farm from bulls selected from the best blood in the kingdom, has taken prizes at the only places in which she was ever previously exhibited, viz, at Ludlow and Kington. She was got by Venison, half-brother to Governor (464); Venison was got by Prince Dangerous (362), by Defiance (416), by Young Sovereign (506), by Sovereign (404). Her dam was Fat Rumps, by Dinedon (399), grandam by Waterloo, great grandam by Trojan, a bull. Fat Rumps bred six calves, one of which was the ox that H.R.H. Prince Albert won the Gold Medal with at Birmingham. Another of the calves (a bull) was sold to the Duke of Richmond, and afterwards, at his sale, was purchased by the Earl of Radnor. Mr. Stedman has been very lucky with his stock, having gained five medals at Birmingham, and two at the Smithfield Club Cattle Show.

PLATE II.

WILD DAYRELL; Winner of the Derby, 1855.

Wild Dayrell, bred by Mr. Popham, in 1852, is by Ion, out of Ellen Middleton, by Bay Middleton, her dam Myrrha, by Malek—Bessy, by Young Gouty—Grandiflora, by Sir Harry Dimsdale—Pipator.

Wild Dayrell is a rich brown horse, standing sixteen hands and an inch high. He has a lean blood-like head, strong arched neck, good oblique shoulders, great depth of girth, good barrel and ribs, with very powerful back and loins. He has strong muscular quarters, gaskins, and thighs, with immense arms, and good hocks and knees. He is somewhat "in" at the elbow, and turns his toes out. He stands short from the knee to the ground, has good bone, but no lumber about him,—very docile in his temper, very perfect in his condition, and, altogether, looking as much like a Derby winner as any horse that ever marched into the Epsom Paddock.

Wild Dayrell has been put to the stud, and will cover a limited number of mares next season at his owner's seat in Wiltshire.

HILL PASTURES.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The improvement of pastures very considerably elevated above the sea, has excited within the last few years considerable attention. The efforts to increase their productiveness have, however, been more energetic and extensive in the northern portion of our island than in either England or Wales; although the holders of the elevated grazing lands of the south and west have the advantage over

their Scotch brethren of an atmosphere considerably milder, and yet at least as moist. Take, for instance, the rainfalls of Scotland, and compare them with those of the upland districts of the West of England. The rain-gauges of Scotland (the westerly side of the kingdom) show an annual depth of 40 inches at Greenock, 30 at Glasgow, 46.6 at Mount Stewart, in the Isle of Bute, and 33 at Applegarth Moor, in Dumfriesshire. But if we compare these more northerly rain-gauge stations with those under Dartmoor in Devonshire, and under the Lake district of Northern England, we find that the average depths of rain at Tavistock and Goodamoor, places under the Dartmoor range in Devonshire, are equal to 53.6 inches and 57.5 inches; in the Lake district, under the hills, the average rainfall is, at Whitehaven 47.1 inches, at Cockermouth 48.5, and at Keswick 63.6 inches. If we take the results obtained from the rain-gauges placed amid the elevated hill pasturage, to which we are now directing our attention, still more remarkable results are obtained. At Prince Town, on Dartmoor, at an elevation of 1500 feet above the level of the sea, 72 inches of rain fell in one year. In the Lake district, at still greater elevations, much more considerable amounts of rain have been collected. Thus, from the observations of Mr. J. F. Miller (*Trans. High. Soc.*, 1851, p. 151), there fell in two years at

	1848.	1849.
CUMBERLAND.		
Whitehaven, 90 feet above the sea..	47.3	38.9
Cockermouth, 126 feet	52.3	38.3
Bassenthwaite Halls, 210 feet	47.0	40.0
Keswick, 258 feet	66.4	48.8
Gillerthwaite, in Ennerdale, 396 ft.	97.7	76.4
Gatesgarth, 326 feet	133.5	97.0
WESTMORELAND.		
The How Troutbeck, 300 feet....	91.3	75.4
Seathwaite, in Borrowdale.....	160.8	125.4

We may note, then, that the effect of considerable elevation of the land is to increase the rainfall; and not only is this increase in the depth of water, but in the number of days on which rain falls: thus, there are 175 rainy days at Whitehaven, on the sea-shore; in Cumberland but 210 in the Lake district—say 30 miles distant.

Again, the effect of considerable elevation is not only to increase the amount of water annually received by the soil, but another effect is produced, not, like increased moisture, promoting the growth of the grasses, but having a very contrary effect—there is a decrease of temperature. Every person is aware of this fact—the very sheltered citizens of London in summer seek the cool hill breezes; but the gradual decrease of the mean temperature, as we ascend the mountain sides, although this has been carefully ascertained, is not so commonly understood. This gradual diminution was carefully examined, with a view to its influence on the cultivation of the soil, by Mr. N. Whitley (*Jour. Royal Ag. Soc.*, vol. xi., p. 4). He remarked very correctly, that whilst it is really difficult to show that latitudinal distance has any marked effect in Great Britain on winter temperature, a few hundred yards of change of altitude produces an increase of cold, at first detrimental, and then destructive of remunerative agriculture. The trap rocks of Scotland, so fertile in low situations, present a scene of desolation on the hills. The grauwacke of Wales, yielding fair crops on the coast, becomes barren on the mountains; and, again, the rich granitic soil on the west of Penzance has its productive power multiplied on the high lands of Bodmin moor and Dartmoor. From the results of some detailed inquiries, we learn that the temperature commonly falls one degree of Fahrenheit for about every 300 feet of ascent.

We may therefore conclude when we are regarding the improvement of mountain sheep walks, that it is not so much the moist climate as its low summer temperature with which we have to contend; and, moreover, we must not forget that there are means to a certain extent of increasing the warmth of even those lands, and consequently promoting their production of grass. These are chiefly—1st, by shelter, as by judiciously placed plantations of such belts of timber trees as are rearable at considerable elevations, like the fir tribe, the birch, &c.; and 2ndly, by drainage. It is very true that lands like those to which I am alluding, which are often held at a rental of from 1s. 6d. to 2s. 6d. per acre, will not bear the charge of expensive drainage; but still, when I was in the lake district of Cumberland and Westmoreland, in September, 1855, I noticed in many places large breadths of mountain sheep-walks, in which no attempts had been made to let the stagnant surface water out of the hollows by merely a common open trench. The effect of drainage and stirring the soil, in increasing its temperature during the summer months, was shown some time since by some experiments of Mr. S. Parkes's (*ibid*, vol. v., p. 142); these were made on red moss, near Bolton-le-moors, in Lancashire, on a bog 30 feet deep, the temperature of whose soil to that depth was uniformly about 46 degrees. The experiment was made in June, 1837, and the report of the first day's observations (June 7) was as follows:—

Depth in the soil.	Temperature of the soil.
31 inches	46
25 „	47
19 „	48.4
13 „	50
7 „	52

We may conclude then that the general result of draining, as of sheltering hill pastures, is to raise their summer temperature, and consequently to promote the growth of a better kind of herbage.

It is impossible to traverse the noble range of mountains which grace the lovely Lake district, without noticing the clear indications which Nature presents of these facts. The superiority of the turf on the warmer sides of the rocks and plantations to that covering the northern and eastern sides; the coarse rushes, or rushy grasses growing in the hollows where stagnant water rests, and the luxuriant heather, fern, and better herbage of the naturally dry portions of the soil, point out to us in very clear language the effect of a few degrees of summer temperature on the natural herbage of the soil.

But when we have availed ourselves of the means of improvement to which I have alluded—when we have thus dried and warmed such lands as these, there yet remains another economical improvement by which much may be profitably accomplished, and that is by the introduction of more productive varieties of grasses.

It is very probable that mountain grasses might be found in various foreign countries which would amply repay the cost of their introduction. For instance, the tussac grass of the Falkland Islands, which grows luxuriantly in a cold moist climate, has been suggested; and moreover there are native plants growing so well on some of our hills which might be readily introduced into others now tenanted by very inferior grasses. Of such a kind is the alpine meadow-grass (*Poa alpina*), whose claims Mr. David Gorrie has well advocated (*Quar. Jour. Agric.*, 1854, p. 440). He recommends it as affording pasturage for sheep and goats at altitudes and situations where few of the ordinary cultivated pasture grasses could be sown with success. On the summit of Ben Lawers, and at similar high elevations on the Grampian range, this native grass may be found growing vigorously with the cloudberry, or Lus-nan-oidhreag of the Highlanders, and some other alpine plants which thrive best in a cool atmosphere, and in a soil that is for many months of the year covered with snow. The Alpine meadow-grass is not, however, particular in this respect, for it takes quite well with being transplanted from the mountain to the glen. Comparatively of little value in ordinary pastures, it would, he thinks, on light hills double or treble the value of many thousands of acres.

This paper is well worthy of the careful perusal of the owners of hill pastures. He thinks that there are two causes which have hitherto prevented the alpine meadow-grass from obtaining a fair share of attention—1st, the difficulty of obtaining its seeds; and 2ndly, the unfavourable way in which it was reported upon by George Sinclair, after his valuable course of experiments in the grass garden at Woburn, on a light sandy loam in a low and sheltered district. But the alpine meadow-grass, like many others of similar habits, does not, as Mr. Gorrie remarks, claim to be regarded as an ordinary pasture grass for arable fields, however well it may grow at low altitudes, and in rich instead of light loamy soils. It is a grass naturally adapted for the summits of mountain ranges, and there it would tell a different tale as compared with other species of the same genus, from what it told at Woburn. "It is," adds Mr. Gorrie, "to the sheep farmer in high districts that this grass offers its services; and as it only grows naturally on some and not all of the highland hills, its introduction to others becomes an object fitted to interest the stock farmer. Besides having the amount of nutritive qualities which it is allowed to possess, it thrives where few other pasture grasses will grow; and at moderate elevations shows greenness and growth at an early period in the spring, when other grasses around it have as yet scarcely been awakened from their winter's sleep."

The improvement of the very hill tops seems a work reserved for an advanced period of cultivation. Man only by slow steps ascends the mountain sides; his early efforts are, as might be expected, confined to the bottoms of valleys, to the sides of rivers. Our forefathers placed their farms —even built their mansions—either in the midst or closely adjoining to rich and moist meadows, or the finest low-lying corn-lands. The clear-sighted monks of those times trod in a similar path; they built their abbeys and monasteries in the richest of districts—they crowded the most rich and picturesque sites. It required a far advance in population, and the consequent increase in the value of agricultural produce, before the poorer soils were tilled—a still later and more skilful race of farmers before the hill sides were cultivated, and even the mountain tops regarded. It is in the later period to which I have alluded that we are placed; and we cannot, perhaps, take a safer and surer path to the improvement of the upland pastures to which I have been directing my attention, than by remembering for our guidance and encouragement, not merely the natural difficulties to improvement with which the hill farmer has to contend, but what has been already profitably accomplished at great elevations; and never on any occasion forgetting the great truth that there is no soil so poor or so unhappily placed, as to be incapable of being rendered in some way or other more profitable.

AGRICULTURAL MACHINERY.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, ETC.

Ever since the appearance of a series of papers, under the signature of "Talpa," and which have been condensed into a small volume, the leading subject of which is The Culture of a Clay Farm, the minds of many persons who are deeply interested in the complete success of agriculture, as comprising the fundamental wealth and prosperity of the country, have been roused to the contemplation of the subject therein proposed. I profess myself to be one of the number, and have long desired the introduction of an instrument which could effectually raise the soil and subsoil of agricultural land, to the full depth of 9 or 10 inches. Such an instrument is called a *Cultivator,* by the author of "Talpa; or, the Chronicles of a Clay Farm;" and some idea of its efficiency may be formed by the perusal of the following lines:—

In the breaking up of new lands, and in every case *where deep drainage* is required, an effectual raising-up and laboration of the subsoil becomes indispensable; and these can only be obtained by a steam cultivator, that is to say a machine which does not roll upon, or otherwise compress the ground like *the heavy* plough, now in common use.

The agricultural public is not altogether unaware of the effect that has been produced by the perusal of the work above alluded to, as is proved by the several abortive attempts that have been made to substitute the fixed *steam engine* as a tractive power in place of the horse. But the entire plough system is founded in error; for, although a plough can and does cut precise and neat furrow-slices, turning and inverting the surface soil to the depth of 5 or 6 inches, yet its "sole" or "share" so compresses the subsoil, as frequently to bring it to the condition of a hard, or nearly impenetrable "pan."

The chief difficulty which presents itself, in carrying out the principle advocated by "Talpa," is the adaptation of a steam engine that shall move forward equally and slowly, dragging behind it a revolving *cultivator,* consisting of strong cutting-teeth (the points case-hardened) fixed to a central shaft, which, being driven by its axis like a steam paddle or circular saw, cuts and tears-up the land, and prepares a deep seed-bed thoroughly inverted and granulated.

Is such an instrument attainable? And is the mechanical skill of our agricultural machinists adequate to effect an object of such inconceivably vast importance? These are questions that I would venture to address to Mr. Wren Hoskyns, in the sincere hope that he will shortly favour us with the results of his present views of the applicability of a revolving cultivator to subsoils of various qualities, and particularly of the mechanical construction of the steam engine and its appendages.

The great fact of the importance of deep subsoil cultivation when raised to the *surface,* is established by analogous practice in garden ground: of this I can speak from experience. Accustomed to have my property in Berkshire deeply trenched by the spade, I on one occasion raised to the top a quantity of soil from nearly two feet below the surface, inverting the upper grass surface, and turning it into the bottom of each trench, as the work proceeded. The earth, so raised, abounded with protoxide of iron, and consequently was of a pale brown tint. Neighbours condemned the work, and pronounced its sterility for years to come. The site was devoted to the orcharding of dwarf standards—intervening spaces receiving several vegetable and root crops—and all succeeded without any failure whatever. It is known that the market gardeners near London produce their amazing crops by deep trenching with the spade, and a corresponding liberal manuring with stable dung. *That* instrument is the type of a perfect tool; and were it possible to bring it into constant farm use, no other cultivator could be required. As it is, however, it behoves the farmer to substitute the most efficient instrument which science can produce; but to this observation we must add another, namely, that by whatever means a strong and *meliorable* subsoil (not a poor and hungry gravel) is raised to the surface, it must be generously manured to an extent at least three or fourfold the amount of that shallow and niggardly top-dressing which is now scattered over the surface. "*Bis dat qui cito dat.*" He that shall have heart and courage thus to begin well, will be rewarded by a grateful staple, that can never fail to repay the labour bestowed in the first instance; for be it remembered that soil *holds fast* and permanently retains organic manure with a pertinacity that nothing except vegetable attractive vitality can overcome. Hence, a plot or field so prepared and manured will retain its fertilizing qualities for years!

Croydon, Oct. 18th, 1855.

THE FAILURE OF THE TURNIP CROP AND ITS CONSEQUENCES.

The injury sustained by the turnip crops must ultimately be felt severely. Throughout the eastern and home counties, a failure will be found to exist greater than has happened for many years. First came a deficiency or total destruction of plant by the fly; then drought and mildew, accompanied by smother-fly *(aphides)* succeeded; and in many localities the leaves have become withered and dried up so entirely, that scarcely any vegetation is now apparent. We are speaking of the Swedish variety; but the common or white turnips are little better. What with failure of plant, excess of drought, black caterpillar, and fingers-and-toes, besides other pests, consisting of grubs in the crowns and at the roots, the injury is general, and the crop, upon the whole, worse than we have witnessed for many years past; and, whether in our gardens or fields, the entire *Brassica* tribe has failed beyond a precedent. Fortunately, the mangold wurzel is more extensively grown than usual; and, owing to the prevalence of exceedingly fine weather in the spring months and at the present time, it promises to become a most abundant crop.

The potatoes also became rather generally attacked with disease; but, fortunately, very few of the bulbs have become affected: and the crop, upon the whole, may be pronounced a good one.

We have been induced to enter upon this subject for the purpose of showing that the difficulty of obtaining large crops of turnips from the same land is yearly increasing, and to point out the advantage to be derived by a more extended cultivation of mangold-wurzel, for on all descriptions of soil too heavy for producing turnips, its cultivation may be adopted with the utmost certainty of success, as of all the known cultivate d root-crops it is less liable than any other to become attacked by insects or by mildew or blight of any description. Provided the temperature is high enough, and the moisture moderate, it flourishes almost without interruption; and its keeping in perfection for many months together without the slightest deterioration, places it, in our opinion, at the head of our winter supplies of cattle food.

An opinion has become prevalent that mangold-wurzel is not calculated for feeding cattle before Christmas, and not even then with advantage until February is past; and we confess that for many years we ourselves laboured under the same misconception. But we have since discovered that the cause did not arise with the roots themselves, but in the mode of their application; and if instead of feeding cattle upon them alone, they are combined with sufficient cut-straw chaff, none of that violent scouring will ensue, and both roots and leaves may be used with decided success by the combination.

With the Swedish turnips the same mode of application may be made, with advantage; but it does not become, in their case, absolutely necessary that such practices should be followed, as they are not liable to produce relaxation of the animals to any extent so as to become injurious when used alone. But it must have become notorious that they yearly become more difficult to produce upon land on which they have been continuously grown for many years, whilst the numerous diseases to which they are liable, and the attacks of insects to which they are subject, render them more and more difficult to obtain as we proceed; and that upon most land which has been devoted to their production, a progressive depreciation, both in quality and quantity, has been for a long time taking place; and with the common turnip a similar depreciation is equally apparent.

The potato is also another example of a root depreciating in quality, and becoming liable to diseases which a few years ago were not known to prevail; and the extreme difficulty that we now have to secure a crop of this valuable esculent has become so apparent, that, under certain conditions of temperature and moisture ensuing, little chance exists of securing a crop of healthy tubers.

The attack that has taken place this season has, we believe, been almost as universal as in other years when nearly all the tubers were destroyed, and would doubtless have been attended with like results had the temperature fallen as low as upon previous occasions. The amount of rain that has fallen during their growth has also been less—not, perhaps, in precise quantity, but less in saturating property, owing to the extreme dryness of the subsoil, consequent upon the absence of almost any rain having for nearly a year previously penetrated to any considerable depth; and it is entirely to these circumstances that we attribute the successful result that is this season accomplished.

From the closest observations we have been able to make, we have invariably found, upon the same plot, that those plants least exposed to cold and moisture uniformly escape with least injury; and in several instances that have come under our

notice this season, we have observed that the stems have not been affected where the plants were growing next a wall or other shelter, whilst those that were farther removed from such protection suffered to a greater or less extent in proportion as they were removed from it. In the memorable blight that first occurred, the same result then took place as regarded the greater or less injury sustained by the tubers; and, although the latter this season have escaped injury, had the temperature fallen a few degrees lower for two or three days at the period when the rain had become prevalent in July, the same catastrophe would most probably again have happened.

It is not our intention to urge this subject unnecessarily. Our object is rather to show that the continuous propagation of any description of plant upon the same land for a series of years tends to a depreciation of its productive qualities, and that such depreciation is pretty certain to be carried out to the plants also, as we yearly proceed. This fact established, what is the means best to be adopted to prevent such a recurrence? We hold that a change either of the land or description of crop is that obviously the best to secure that end. If after Swedish turnips or cabbages mangel wurzel or potatoes were grown in the next rotation, and then common turnips or rape, and so on from year to year, so as to obtain the longest period possible betwixt the cultivation of any one description of crop in particular, the object would to a great extent become attained. Upon a proper rotation of crops the main success of all cultivation depends; the cereals alternating with the legumes, root crops, and grasses, constitutes the true application of the science of agriculture. Will it not, then, be attended with corresponding success to produce an alternation with our root crops, as before stated? So firmly are we convinced of this, and so rational must it appear to others, that we believe we shall hardly be accused of making converts to our opinions; but we trust, notwithstanding, that we may calculate upon being the means of directing investigation and inquiry into its right channel, and also for a beneficial purpose.

THE PRESENT PRICE OF WHEAT.

The average price of wheat for the six weeks ending October 6th was 75s. 11d. per qr. The average for the corresponding period of last year was 56s. 7d. Wheat is therefore 19s. 4d. per qr. higher than it was this time last year. It was then a little above that mystical 56s. which, when we were in the lowest depths of agricultural distress, all looked up to as remunerative; while there were even some, and those not amateurs, but men whose sole dependence was upon farming, who did not hesitate to declare that they would be satisfied with 50s. per qr. No man can deny that present prices are remunerative, or that if they are not, a further rise will be powerless to make them so. The prudent farmer dreads a further advance. He knows that, sooner or later, it must be followed by a decline, and he knows that in many items of the cost of cultivation expenses must increase as prices rise. He sees that landlords are more interested in high prices than tenants, unless, which is impossible, those prices can go on indefinitely increasing. His rent, he knows too well, must ultimately follow prices. If he holds as tenant-at-will, he may be certain that his landlord will not continue to pay 30 per cent. more than he has been accustomed to pay for bread, meat, butter, cheese, and other articles of agricultural produce, without looking for an advance of rent. If the farmer holds under a corn rent, and we know many who do, he looks with anxiety to every rise of the markets, least he should have to pay rent on a scale higher than that at which he has sold a large portion of his crop. And he knows that, with the experience of the past before them, landlords are unwilling to grant leases at a fixed money-rent which they know will only bind them while prices are expanding, and that when the times of depression come they shall have to make abatements. The prudent farmer, again, is unwilling to bind himself to a fixed money-rent for a term of years based on prices which may not be permanent.

Then, again, seed and horses consume as much of the produce whether wheat and oats be selling high or low. As for manual labour, too, the farmer knows that, instead of two men looking after one master, two masters are now looking after one man. Those districts which depended on a periodical influx of Irish labourers for their harvest, receive them no more. They have solved the problem of a self-supporting emigration. The Highlanders who performed in the same way the periodical labour of the Scottish lowlands are emigrating to Canada, where they can obtain land of their own. The English rural population are shaking off their dread of foreign parts; they are acquiring a better knowledge of them, and of the prospects they afford to the poor man of becoming a landowner, and employer of labour himself. We

cannot take up a local paper, be it English, Irish, or Scottish, but we meet with statements of the scarcity of hands and the rise of wages. Under this state of things the landlords, with a few insignificant exceptions, are quite as much disposed as the farmers to let bygones be bygones, and to accept the change as an accomplished fact. We consequently rarely hear at our agricultural meetings declarations on agricultural grievances from that class: on the contrary, they appear more disposed to devote their energies to improving the moral and social condition of the agricultural labourer. The clergy are zealously seconding their laudable exertions, if indeed they did not originate the movement. For ourselves, none can deny that we fought the battle of protection zealously and fearlessly as long as the position was tenable.

We cannot, therefore, be accused of want of sympathy with the agricultural interest, when we express regret at such speeches as one which we were obliged to read as reported in the *Norwich Mercury*. Not to misrepresent the speaker, we will quote his own words:—

"Mr. Tuck, in responding to one of the usual toasts at which the usual rewards for good conduct had been distributed to farm labourers, said he wished for one moment to refer to the repeal of the corn laws, and he believed he might be permitted to do so without infringing the rules of the association, as the question was settled, and had no longer a political existence. There was a great deal of suffering after the measure for the repeal of the corn laws was passed, and no one knew better than he did that the loss of property was enormous; but he believed that they were suffering still from the repeal of the corn laws, and he would prove it. The repeal of these laws caused extravagance and uneconomical practices on the part of the labourers, that years and years must elapse before they would return to their former habits. In the years 1848 and 1849 flour was so extremely cheap that they did not care how it was wasted, and he would give them an instance of it. He once saw three or four children of one family, in the middle of an afternoon, with a large piece of bread in their hands, eating some of it themselves, giving some of it to a dog, and throwing the greater part on the road. He rode up to the cottage in which they lived, and asked the woman why she encouraged such waste in her family; and her answer was, 'Sir, my husband would be extremely angry with me if I refused these children a piece of bread and cheese at any time of the day.' It was in vain he told her that the children of gentlemen, when they were sent to school, had their meals at stated hours, and were not allowed food at any time they pleased. All he could get from the woman was, that it was very hard to deny the children a piece of bread."

Mr. Tuck then detailed further examples of the reckless extravagance of the farm-labourers, as exemplified by a case which did not happen under his own observation, but was told him. There was, it seems, a man who was paid his wages on a Monday, of all the days in the week! and got drunk till the Friday, when he and his whole family were found fasting on dry bread; and all this was attributed to the repeal of the corn-laws. At the time these enormities were committed, wages in that part of the country were no more than 8s. or 9s. a week, we believe.

Now the strongest argument ever urged in favour of the corn laws was that they were not intended for the benefit of landlords and farmers, but for that of the farm labourers, whose wage depended, it was said, on the price of corn, and who consequently, by a high price of it, obtained a greater command over the other necessaries of life; and we have met with cases of farm labourers who have adopted these views. Here, however, we have Mr. Tuck knocking the brains out of this argument, and proving, after a logic of his own, that the repeal of the corn laws had given the labourers such an abundance of bread that it made them wasteful.

On behalf of the tenant farmers we repudiate this doctrine, and we are happy to see that it did not pass unrebuked at the meeting; for we read that Mr. Isaac Everett said—with reference to the observations made by Mr. Tuck, that the labouring classes were extravagant—"he should be very sorry to be placed on their small incomes, and he did not know any class who managed a small income so well. As to what Mr. Tuck had said about labourers' children giving a piece of bread to a dog, he did not deprecate such a thing, and he wished every poor man had a piece of bread to spare."

These words were spoken in the spirit of that King of France who wished every poor man in his kingdom had a fowl in the pot on a Sunday; in the spirit of the late Lord Leicester, who, when it was complained that his tenants drank claret, declared that if there was any wine they liked better, he should wish them to drink it. It is in the self-same spirit, too, of the present Lord Leicester, whose admirable speech at an agricultural meeting on the best means of improving the condition of the rural labourer we lately reported.

THE SEVERAL DIVISIONS OR HEADINGS UNDER WHICH FARM ACCOUNTS SHOULD COME.

One of the first objects in keeping farm accounts is to ascertain the expenses, and divide them properly among the different fields, crops, and cattle.

There are certain *general* expenses, such as "rent, tithe, rates, and taxes," which are commonly distributed equally over every field; but this method, though very convenient, favours the lands of superior quality, to the disadvantage of the poorer parts of the farm: hence, if an experimental character is to be given to the farmer's practice, he should value every plot according to its worth, under or above the average rent paid for the whole occupation. An other general expense is that of fences. We should reckon the economy of crops from the net cultivated area, and not from the gross measurement of our fields, hedges, copses, drains, and grass borders may be accounted for, as to their cost in labour, and their return (if any) in wood, &c., under the general head "Fences," without reference to arable or pasture, or different fields.

"Sundry Expenses" may be the title of an account which has place on every farm, including payments concerning the business in general; as, for instance, a bailiff's salary, marketing expenses, the cost of mending roads, of catching rats and moles.

"Wear-and-tear" — comprising payments to blacksmith, carpenter, wheelwright, and harness-maker—ought scarcely to be apportioned in the same general way. The arable land will evidently absorb the greater part of these expenses; mowing grounds very little; and feeding grounds still less. But, to avoid any arbitrary estimation when a rule can be established, a suitable mode of dividing this expense per acre will be by making the cost of the teams a guide for it; that is, finding how much per cent., or in the pound, of the team account this wear-and-tear amounts to, and charging it to each field accordingly.

The "Team Account" is commonly more mistaken than any other on a farm. It is very usual to see accounts in which ploughing is charged at 6s., 7s., 12s., or whatever may be the hiring price of the country; but few words are necessary to show that this may be entirely fallacious. There is no such thing as a free market value for agricultural horse-labour, because you cannot buy your commodity when you want it; and he who depended upon hired teams for all the work of his farm would soon find the state of his acres calling for a very different system. Every practical farmer knows that the way to have cheap tillage is to keep the teams well employed; and when a man's own work is done, his horses stand idle, unless he lets them out to his neighbours, which he will do at a lower price than his own work costs him, and yet find some advantage in it. The true means of ascertaining the real expense of all team-work seems to be in valuing their green food at so much per week in summer; their hay, straw, and corn at so much in winter; their shoeing, doctoring, and daily attendance; and their gradual decline in value, from age and labour. In order to divide this total expense fairly among the work executed, a day-book is required (which the farmer or his man may keep), specifying the particular field or business in which both teams and men are employed every day in the year. At the close of the year the aggregate expense is proportionately divided among the work; the clearest truth and correctness being necessarily the result.

The article of manure is much more complex, and, upon the whole, the most difficult account there is for a farmer to keep. It may be arranged under the title, "Farm Yard:" and it connects with so many objects, that no little care is necessary to keep it; and with the greatest attention some doubts will still remain. We know what we give for guano, or other purchased fertilizer; but how shall we approximate to the money value of yard-manure? If we let the straw go for nothing—as a commodity again returned to the land, and so being neither an import nor export of the farm—we shall be spared some trouble, but possess no means of comparing the profitableness of different fields and crops according (among other items) to the weight of their manurial dressings. Suppose we attempt to value all the straw and roots supplied to the cattle, we have to deal altogether with suppositions; but this must be done if we wish to know what the manure-making really costs us. We should therefore, if possible, find pretty nearly the price for which our straw or roots would sell, and put them down at that sum. Then we must ascertain the weekly cost (if possible) of such keeping for cattle, and credit the farm-yard account with it; which cost is also charged to the debtor side of the cattle account, as a part of the expense of keeping them.

The proportions of oilcake and other feeding-stuffs which should be charged to the manure and cattle respectively cannot be fixed with certainty;

but the farmer should deduce a rule for his individual practice from the researches of chemists and experiments of practical men, as far as they are yet advanced in the examination of this difficult question. Of course, whatever labour is bestowed upon the manufacture of the manure is charged to it; and when the whole has been carted on to the land, the total expense is divided by the number of loads, and the cost per load thus determined. It is charged the year following—as the time consumed will make that delay necessary—to the account of the fields on which it is spread; and though the whole advantage is by no means exhausted by one crop, yet the whole expense must be charged to the crop that receives it, or the accounts would be kept open so long as to create confusion.

One of the most complex and difficult accounts is that of grass lands. It is involved with cattle of all kinds, with hay, with the teams; and in such a manner as to make an accurate separation very troublesome. How is the value of the feed to be calculated? If we attempt to value the progress of the grazing stock per week, the price fixed is altogether arbitrary: if the actual profit or loss on the live stock be made the product, the grass land must be made a mere item of the cattle account. There are objections, also, to the method of charging so much per head for the keep; but it certainly appears the most feasible. One account should therefore be opened for "mowing ground," in which are charged the rent, tithe, taxes, and all expenses in one total for every field mown; the credit of it to consist of the market value of the hay mown, as delivered to the teams, fattening beasts, cows, sheep, &c.; which several accounts are debited with their respective consumptions. The aftermaths of course are to be reckoned as "feeding grounds," at so much per acre; and the grazing pastures are to be reckoned as producing so much keep at the price per head they would be worth at agistment.

How are we to estimate the value of the turnips supplied to cattle and sheep? If the live-stock account is charged with the prime cost of the roots, that is, with the expense of cultivating them, it will be by no means fair; as a loss in a fallow crop is submitted to for the sake of grain crops that follow. The plain way of proceeding is to value the roots at what they would sell for, and to debit the cattle accounts with their respective consumptions. But there are two prices of turnips; one for carrying the crop on to another man's land, the other for eating them in the field. The latter ought to be the rate chosen, charging the cattle with the labour and expenses of carriage.

When an actual profit has been realized by cattle feeding, it is easy to divide it over the fields which fed the stock: but then it will remain unknown whether the profit or loss belongs to the land or the stock fed by it. An estimate of the money value of the food raised from the land, and consumed by the stock, seems alone to be satisfactory.

Of course there must be an annual valuation of live stock and implements not bought and sold within the year; the standard being the price they would sell for at the moment.

The hints we have now advanced, without touching upon all the branches of the subject, may be of use in directing the farmer's attention to the general principles involved in his accounts, which must still be necessarily more or less intricate and open to doubt.

ON THE ROTATION OF CROPS.

It is a generally-established maxim among all enlightened and intelligent husbandmen that no branch of the profession of agriculture requires more judgment, or more conspicuously shows the skill of the farmer, nor is there any on which the profits of the cultivator more certainly depend, than the order in which the several crops that are cultivated are made to succeed each other. The effects of plants on the soil are very various; some have a tendency to impoverish it much more than others; some bind, and others loosen it. Hence it is necessary to attend to the peculiar nature of each plant, and to examine in what manner its culture affects the soil. By this means we shall be enabled to determine in what order we ought to arrange the crops one after another, so as to keep the ground always in heart, and yet to make it yield the greatest produce possible; which two particulars form the grand object of a correct and systematic rotation of crops.

Culmiferous crops are such as have a smooth-jointed stalk, and mostly contain the seeds in chaffy husks. These, especially when they are approaching the ripe state, draw their nourishment chiefly from the soil, and derive but very little from the air; therefore, when they are cultivated for seed, which is most generally the case, the ground cannot fail to be impoverished by them. On the contrary, the same plants, when young and clothed with verdure, will derive a considerable portion of their nourishment from the atmosphere; and therefore a culmiferous crop, when cut green or eaten

in that state by animals, does little or no injury to the land. A crop of hay, cut before the seed is ripe, as it should be, does not much rob the ground.

Leguminous plants, as beans, peas, and vetches (so called from the word "Legume," from "lego," to gather, because the fruits are plucked or gathered from the stalks, and not mown), extract, by means of the broad-spreading leaves, most of their nourishment from the air; and none of these plants, when cut young, injure the ground. But if leguminous plants be allowed to ripen the seeds, their effects on the ground are still much less severe than of culmiferous crops in a similar condition. Other remarkable circumstances distinguish those plants. All the seeds of culmiferous plants ripen at the same time; as soon as they begin to form, the plant becomes stationary, the leaves wither, the roots cease to push, and the plant, when cut down, is blanched and sapless. The seeds of a leguminous plant are formed successively; flowers and fruit appear at the same time in different parts of the plant. This plant is, therefore, continually growing and pushing its roots; hence the value of pea and bean straw above that of wheat or oats. The latter is withered and dry when the crop is cut; the former is green and succulent.

The difference with respect to the soil between a culmiferous and leguminous crop is very great. The latter, growing till cut down, keeps the ground in constant motion, and leaves it to the plough in a loose and mellow state; the former ceases growing long before being reaped, and the ground, from want of motion, becomes compact and hard: and also dew, falling on a culmiferous crop after the ground begins to harden, rests on the surface, and is wholly evaporated by the next sun. Dews that fall on a leguminous crop are shaded from the sun by the broad leaves of the plants, and sink at leisure into the ground. Accordingly the ground, after a culmiferous crop, is dry and hard; after a leguminous crop it is loose, soft, unctuous, and mellow.

Bulbous-rooted plants, as turnips, and especially potatoes, are superior to any other in loosening, dividing, and pulverizing the soil. Potato roots grow generally eight or ten inches under the surface, and by their number and size they divide and pulverize the land better than can be done by the plough; and, whatever be the natural colour of the soil, it is black when the potato crop is dug up. But carrots and parsnips are superior even to potatoes in this valuable property; for the tap roots penetrate to a depth of eighteen inches, and move and divide the soil in their course. Turnips are rather inferior, as the bulb grows above the ground; but it is still much superior to a culmiferous or a fibrous-rooted plant. Red clover is similar to the turnip in that respect. From the properties now mentioned which the plants inherit, culmiferous crops in a continued succession would render the soil too hard, and leguminous crops would effect the contrary in making the land too loose; and hence the necessity of making the one succeed the other in alternation, so as to keep the land in a proper state, and at the same time produce the greatest possible quantity of each crop.

In arranging any system of rotations of crops no invariable rules can be given, which will prove adapted to all cases; because very much depends on soil, situation, climate, and other circumstances. In the very variable state of British soil and climate no very fixed rotation can be prescribed; but there are some material points to be regarded, which no circumstances must overlook. The crops must be suited to the nature and state of the lands, and culmiferous and leguminous crops must be interposed betwixt each other, and this constitutes what is called the "alternate husbandry;" but it has been found that the lighter soils are not suited even for alternate husbandry, and that they require a rest in a state of herbage or grass, in order to recruit the fertility. Another general rule may be mentioned—that the same kind of crop or plant must not be repeated at too short intervals, or both the produce and the quality will be diminished. And this experience holds as well in green crops as with the cereal plants.

The basis of every rotation may be held to be the summer fallow, or the fallow on which the drilled and manured crops are cultivated, and the conclusion of the course to be with the crop taken in the year preceding a return of the fallow or the drilled crops, when the rotation ceases, and a new one commences.

In mentioning rotations of crops as a most vital part of the science of agriculture, it is by no means intended to convey an impression of the necessity that every farmer should and must bind himself to a slavish routine, but only to direct attention to the study and consideration of that branch of the art, from which so many great and lasting benefits have been found to proceed. A cultivator proceeding without a correct knowledge, or some knowledge of rotations, is not unlike a ship at sea without a helm; but, even with this knowledge, the real value of every rotation depends in a very great measure upon the fidelity shown in executing the several processes of labour that belong to it. Though in the variable climate of Britain no fixed rotation can be prescribed, yet some rotations must be viewed as more valuable than others, because the crops therein included may be most suitable to the particular soils on which they are cultivated, or

the produce may be better adapted to the market demand of the country, which must ultimately regulate the kinds of produce that are most deserving of cultivation. Holding these points in view, alternate husbandry, or the system of having leguminous and culmiferous crops to follow each other, must be reckoned most judicious and deserving of commendation; and with some modifications, it may be practised on any soil and in any situation. According to its rules, the land would rarely get into a fould or exhausted state; at least, if foul and exhausted under alternate husbandry, matters would be much worse if any other system were followed. The rotation may be long or short, as is consistent with the richness of the soil on which it is executed, and other local circumstances. The crops cultivated may be of any of the varieties that compose the two tribes, according to the nature of the soil and the climate of the district where the rotation is used; and, where circumstances render ploughing not so advantageous as pasturing, the land may remain in grass till these circumstances are obviated—care being always taken, when it is broken up, to follow alternate husbandry during the time it is under tillage. In this way it is perfectly practicable to follow the alternate system in every situation; nor is the circumstance of the land being in grass for two, three, or four years, any departure from that system, as it is usually rendered necessary by the scarcity of manure, poverty of the soil, the want or the distance of markets for corn, or other accidental circumstances. The basis of every rotation, as before observed, is the bare summer fallow on clay lands, and the fallow on which drilled and manured crops are cultivated; and the conclusion of the rotation is, with the crop taken in the year preceding a return of the fallow or green crops, when of course a new rotation commences.

We now proceed to state the most approved rotations: on the strong clays, loams, on the lighter loams, and on sands and peats.

The clay soils which have been found incapable of being cultivated for green crops, may be divided into two kinds: the superior class, which produces very abundant crops, and constitute the greater part of the arable lands in some districts; while the inferior kinds, which much abound in this kingdom, yield very scanty and precarious returns. On clays of the best quality, and in situations where manure is plentiful, a very favourable rotation has been—1st year, fallow; 2nd year, wheat; 3rd year, clover; 4th year, oats; 5th year, beans, drilled and hoed; 6th year, wheat. Manure may be applied on the oat stubble, or in the spring with the beans, if the nature of the land will admit. In the most favoured situations this rotation is well adapted for alternation, and for keeping the land clean, and in proper tilth. The four years' course of—1, fallow; 2, wheat; 3, clover, peas, beans, or tares; 4, oats, is much esteemed by many eminent cultivators, and may suit very well on lands of good quality; but the recurrence of the same crop is too frequent on land of any quality, and it is gradually giving way to a more extended rotation. Where the land is loamy and sufficiently mellow to admit the growth of barley, rotations of six and eight years have been followed, and they include a greater change of plants from that circumstance. 1, fallow; 2, wheat; 3, beans or peas; 4, barley; 5, clover; 6, wheat or oats; or, 1, fallow; 2, wheat; 3, peas; 4, barley; 5, clover; 6, oats. Here the clover crop is too far removed from the fallowing process, which supposes the land in the best state of preparation for the reception of the small and tender seeds of grasses. A shorter course is sometimes used: 1, fallow; 2, barley; 3, clover; 4, beans, peas, or tares; 5, wheat. And also: 1, fallow; 2, barley; 3, peas, beans, or tares; 4, wheat; or, 1, fallow; 2, wheat; 3, peas; 4, oats. These courses may be varied alternately with clovers in the third year. The longer courses more approved are: 1, fallow; 2, barley; 3, beans; 4, wheat; 5, tares; 6, barley, dunged on the stubble; 7, clover; 8, beans; 9, wheat. And, 1, fallow; 2, wheat; 3, beans; 4, barley; 5, clover, dunged; 6, oats; 7, beans; 8, wheat. This course may be reduced to six years, by not dunging the clover ley, and by making oats the last crop. And also, 1, fallow; 2, barley; 3, clover; 4, beans, dunged; 5, wheat; 6, tares; 7, wheat. The two wheat crops are here too near to each other, and the fifth crop may very well take the place of the second. Another course has been used: 1, fallow; 2, wheat; 3, beans; 4, barley; 5, clover, dunged; 6, oats; 7, beans, drilled; 8, wheat. If the land be clean and in tilth for clovers, this rotation claims much merit, and may be improved by exchanging the fourth and the second crops for each other.

The following course possesses much merit, and joins the bean and pasturage farming, a circumstance never met with, and which would rarely be allowed:—1, fallow dunged; 2, barley; 3, grass; 4, ditto; 5, oats; 6, beans, drilled and hoed; 7, wheat. The crops are well varied, and the land derives the advantage from rest in pasturage, which refreshes the ground more effectually and durably than any manuring. Lime may be applied on the bean stubble, and the winter ploughing will secure a pulverized surface for the barley tilth, if due advantage be taken of a dry state of the land for sowing. The action of the lime might be better developed if applied on the barley or bean tilth in the spring; but if the climate and the soil be pre-

carious, they might prevent the application. A better course can scarcely be devised.

In many cases the land is much too hard and stiff for barley, and there the course of four and five years with beans and oats may be adopted. On the inferior soils of this description the following course may be usefully employed:—1, fallow; 2, wheat; 3, clovers, trefoils, seeds, or cinquefoil; 4, ditto; 5, wheat or oats, beans, peas, or tares. The grass crops may be prolonged if thought fit, and form a course of six years. Another rotation for inferior clays has been recommended—1, fallow; 2, oats; 3, grass; 4, ditto; 5, ditto; 6, beans, drilled; 7, wheat. And also—1, fallow; 2, barley, wheat, or oats; 3, clovers; 4, ditto; 5, oats. A crop of winter tares sometimes precedes the fallowing process, and are eaten on the ground; but the mode is generally imperfect, as a very effectual part of the process is usually performed by the time the first furrow is given to the land, and the state of cultivation is always much inferior to the fallows that are effected from winter ploughings, which have derived the benefits of atmospheric action. The custom is not unfrequent on turnip soils; but even on these lands the fallowing tilth will be inferior, except in some few particular cases.

These courses of cropping suppose lands of good quality, and a capability in the soil of being drilled with leguminous crops for the purpose of preserving the land in a clean and pulverized state. But on the inferior clay lands in this kingdom there is no possibility of drilling any green crops; the dung may be applied on the autumnal stubble, and a leguminous crop may be sown in the spring; but it will then be a broadcast crop, and confers no benefit on the land, and has no tendency to defer the fallowing process, as it has been found impossible to assist the benefits of fallowing to the land by any intermediate operation of dunging and pulverizing the soil. The rotations of cropping on those lands are more curtailed as the entire processes of the rotation depend on the benefits of fallowing, and the quality of the land will not endure the constancy of cropping that is practised on soils of a richer constituent quality. On all wheat soils the process of fallowing constitutes the foundation of the whole course: if that be neglected, the future produce will be in every case diminished; if the rotation be formed of alternate cropping, the land is speedily exhausted; and the too frequent recurrence of the operations of ploughing are known to tire lands that are weak in texture and in composition. These soils are usually of two kinds—one of a brick-like nature, and red or black in colour; the other of a much softer texture, and both rest on a wet clay bottom, are more or less retentive, and not unfrequently mixed with gravels and sands. Of all soils, they are the most precarious to manage, and yield the smallest returns; they are mostly, but not always, found in inland situations, and distant from the sources of manure, and are unable in themselves to maintain the animals that are necessary to afford the requisite materials of that indispensable article. A farm wholly or mostly composed of these sterile clays is a very heartless concern; but they are generally found interspersed with portions of turnip land, which very much improves the management. On such soils wheat has been proved, in most cases, to be the most profitable crop, though many high-lying situations will occur, where oats may succeed better, from the climate being too late for an early plant. The rotation of four years—or, 1, fallow; 2, wheat; 3, grass seeds, mown or pastured; 4, oats—has been, and is yet, very injudiciously followed on these lands; for the farmer does not possess manure sufficient to support constant cropping, and consequently a rest in pasturage must be substituted to recruit and refresh the land. It has been proposed to sow peas, beans, and tares during the third year in the fields alternately, so that clovers may occur only once in eight years. The following course has been very profitably employed:—1, fallow; 2, wheat; 3, grass seeds, mown or pastured; 4, pasture; 5, peas, beans, and tares; 6, oats. A course of five years may be adopted, by sowing any of these plants after pasture, and would become—1, fallow; 2, wheat or oats; 3, grass seeds, mown or pastured; 4, peas, beans, and tares; 5, oats: or, 1, fallow; 2, wheat or oats; 3, grass seeds; 4, pasture; 5, oats, or peas, beans, and tares. In high latitudes that are unfavourable for leguminous plants, the following course may be useful:—1, fallow; 2, oats or barley; 3, grass seeds; 4 and 5, pasture; 6, oats. Many or most of these soils are physically inappropriate for barley, and also for leguminous plants; and a failure of the latter crop invariably produces an abundance of weeds, and renders the land very foul. If the tare crop be eaten on the ground by sheep, it would very much assist the following grain crop; but the nature of the land is adverse to such a system, unless in some few cases of soil and of season that are of rare and unfrequent occurrence. Pasture will preserve the land in a cleaner state, and adds to the vegetable freshness that will supply the place of manure which the farmer does not possess; and if leguminous crops cannot be obtained in fair quantities, they had better not be attempted; and the poor quality of the soil prevents the use of tares and clovers by being consumed on the ground; for the crops themselves cannot be got in sufficient abundance to confer any benefit on the land by that mode of manuring, the crop of hay being in

many instances too light to be cut, and must consequently be used in pasture.

A very general opinion prevails that grasses will not grow on these lands, and certainly for the best of all reasons—because the seeds are seldom or never sown; but experience has proved that a close sward may be produced, and sheep grazed and fattened, without any danger from rot and other diseases that are so much apprehended on wet lands of that description. The fresh herbage of the sown grasses affords a wholesome bite, which is renewed by a fresh sowing of seeds before a contagious deterioration of the herbage takes place. It may not be improper to mention here some plants that have been found to produce the pasturage that is so very desirable on such lands, at per acre:—Half a bushel ray grass, half a bushel cocksfoot, 6lbs. dogstail, 4lbs. of catstail, 4lbs. meadow fescue, 6lbs. red clover, 6lbs. white clover.

If the soil be damp and soft, and does not rank among the harder brick-like clays, the quantity of dogstail may be diminished, and that of the catstail and meadow-fescue increased. A mixture of rare and expensive grasses would be altogether misapplied on such land; and in case of soils of any quality, it will be found more profitable to sow a quantity of the seeds that are known to be the best suited to answer the purpose, than a mixture of plants that may never grow in any sufficient quantity, and many of which are of a doubtful value when obtained. The harder kinds of these soils should be reduced and pulverized in the early season, by the mechanical action of the plough and the roll; harrowing will be of little use till the later season soften the very adhesive composition of the soil. Lands of any description cannot be too much reduced and pulverized; but they may be rendered too spongy and vacant between the particles, which shows the necessity of consolidation after a complete reduction has been effected. The black and softer kinds will require less labour, as they will crumble spontaneously by the effects of the late rains; and if force were applied to reduce the texture in the early season, the soil would become too fine for wheat, and be apt to throw out the plants during winter. On some lands early reduction would be very difficult, if at all possible; but it would be attended with the advantage of consolidating and acquiring a consistency by October for the seed furrow.

On this latter sort of clay lands, leguminous plants have a better chance of success than on the bricky kinds; and a crop of peas and of tares may be very profitably used in the rotation. A variation in the kind of plants that are sown is thus obtained, and a benefit is conferred on the lands by the smothering shade of the leguminous crops; but they ought not to be used unless a crop can be procured to cover the ground closely and evenly, for a thin straggling crop of such plants is the most pernicious to clean lands that is known. The grass seeds should be sown on a surface pulverized by harrowing and rolling, and then covered by a light application of the same implements.

Any improvements that may be contemplated to be executed on clay lands must be preceded by complete draining at the distances of twelve to twenty feet, according to the extreme or partial wetness of the soil; and may be effected by drains running straight, oblique, or across the lands, as may suit the inclination of the locality. Many of the better clay lands are at present in a high state of cultivation, in the neighbourhood of towns and in favourable districts; but the greater part is yet susceptible of very much improvement, and probably of more profitable improvement than any other kind of land in the kingdom. The draining should be executed as a permanent improvement chiefly by the landowner, with a corresponding assistance of the farmer; or it may be executed at the single expense of the farmer, on the proper security of a lengthened tenure. The circumstance of all wet lands not being now drained, after the obvious and profitable results which have been obtained by that improvement have been made known to every possessor of the soil, reflects a disgrace on those concerned, and who have both the means and the power, hardly to be wiped away by the future tardy performance. In the midst of the greatest rage and outward anxiety for improvements, the most obvious, the most necessary, and the most certain of any in the result is totally neglected, and without which operation on that class of soils all other improvements are in a great measure lost in effect. The cutting and clearing the courses of brooks and rivulets must precede or accompany draining, and also the opening of the receiving ditches round the fields; and after the complete drainage has been effected, the modern improvement of ploughing the subsoil may be introduced, followed by an application of calcareous earths, limes, and chalks, in quantities of 300 to 600 bushels an acre, in order permanently to alter and improve the texture of the soil as the nature of it may require. Any general benefit that might be derived from the use of calcareous matters on such soils is lost by the reason of the want of quantity, and from the land not being prepared for the mixture. It remains to be seen what ultimate effect the complete drainage will effect on these stubborn clays—if they will be converted in any instance into a fit state for green crops, or only rendered more accessible at the different seasons, and easier of management by the present mode of cultivation, in addition to the in-

creased productiveness. Some soils, from an original near alliance, may be rendered fit for green crops; but many, or most truly clay lands, are, it may be supposed, placed beyond that possibility. When such improvements are required to be performed, they should be done at once, promptly and effectually; for not only is more time gained for reaping the benefits, but the pernicious frittering policy is avoided which squanders the means of action on many points, and effects no object completely, and by which the produce of each is lessened, from want of concentration to produce any satisfactory result. In no active business of life has this policy, absurd and puerile as it may appear, been attended with more mischievous consequences than in agriculture; for with some few very meritorious exceptions, it pervades arrangements and detail of operations, and fetters and prohibits any very great advances in the improvement of the art. When a quantity of means is allowed, to effect any object, it is very usually exerted on multiplied points of resistance, and none of which is overcome, by reason of the force being too small that is applied to each, and consequently none of the objects is productive of the expected result.

The general mode of working and reducing clay lands, by exposure during the heats of summer and to the vicissitudes of the weather, is well known; and in most cases it is performed in tolerable perfection. But observation has shown that the covering of land produces a fertilizing effect, and kills weeds; and it is probable that at some future time there may proceed from this hint an important and valuable alteration in practice, which may be ascertained by a few decisive trials made on fair and tangible grounds, which do not in the smallest degree affect the usual results of cultivation, and at the same time are fitted to justify the conclusions. The covering that would be afforded by a crop of tares, or a similar substance to rot on the ground, might lead to some means of accomplishing the purpose. Straw has been applied one inch thick as a covering to wheat seeds pressed into the soil on untilled lands, and the crop yielded a very large return of sound and healthy grain. The straw would afford protection against both cold and drought, and also nutritious matters by its decomposition, and the weeds will be effectually destroyed. One good crop of any plant may be got from a single process, and yet be inadmissible into a system; the means that are required for the purpose of protection must be carefully considered, and also the bearings of the future crops, and also on the other parts of the prevailing mode of cultivation, as it may operate more damage in some quarter than the advantages that are derived in another. Such suggestions tend to confirm the seemingly very just opinion that all manures are best applied on the surface, and that plants derive the chief part of their nourishment from the atmosphere, and that the earth performs only a secondary part in the process of vegetation. Dung covered in the soil encourages an exuberance of roots and fibres; whereas all healthy and soundly productive plants have the the roots sharp, hard, and crisp, like the claws of a bird. Wheat covered with straw on a plate of glass grew well, which further confirms the theory. The present modes of production are very laborious and expensive, and our investigations may probably soon discover much easier and shorter roads; for in the progress of observation and science, the necessity is daily felt of surrendering opinions and maxims which have long been trusted and received on authority; and we must not suppose that our observation and experience have explored all the paths, or exhausted all the stores of nature.

The second class of soils that was mentioned contains the better turnip lands, and the loamy clays that are capable of being cultivated and planted with green crops. These soils constitute the most valuable class, and are capable of producing in abundance all the plants that are held in the greatest estimation for the purposes of husbandry. The fallowing crops are Swedish turnips, potatoes, and wangel-wurzel, being the most valuable plants that are known, and all of them capable of being raised on these lands with due preparation and encouragement. On many loamy clays draining will be required, and must be performed before any other expense be incurred. These crops can be removed, to admit wheat being sown at the proper season; and hence the high value of the land, in producing the two crops of the greatest value in succession. A course of six years is much approved on these soils: 1, green crops; 2, wheat; 3, clovers, cut for hay, or used for soiling, or consumed by live stock on the ground; 4, oats, or leguminous plants; 5, winter tares, or late turnips eaten on the ground; 6, wheat. Or the four years' course: 1, green crops; 2, wheat; 3, clovers; 4, oats. Beans, horse and hand-hoed, may be used after the oats along with the winter tares in portions, and alternately, as the work goes on; and the land will thus obtain a change of plants, and the green crops may be varied to suit a similar mode of cultivation. The four years' course—1, turnips; 2, barley; 3, clover; 4, wheat—is too short, and the same plants recur too frequently; and it has been proposed to double the course, and extend it to eight years—thus: 5, cabbages, or mangel-wurzel; 6, oats; 7, tares, or peas; 8, barley. And for two years more: 9, beans; 10, wheat. And also: 1,

turnips, or cabbages; 2, barley; 3, clover, or tares; 4, wheat; 5, potatoes, or beet; 6, barley; 7, clover; 8, oats, or wheat. And also: 1, beet and potatoes; 2, oats; 3, clover; 4, wheat; 5, turnips and cabbages; 6, barley; 7, beans, peas, and tares; 8, wheat. The rotation of eight or more years is a repetition of that of four years, with the object of changing the plants raised as green crops, and substituting a leguminous and clover crop alternately, so that each occurs only once in the course of the rotation. But this object may be attained by varying the four years' course in the fields as they occur for cropping in succession: and if the soil be not all alike suitable for similar cropping, a change in the plants will be necessary. A course of five or six years is most generally preferred, and is found to be most commodious, as it affords a full opportunity of cultivating the most valuable plants, and also of profitable alternation. A course of six years has been very usefully employed: 1, turnips and other esculents; 2, wheat; 3, beans, peas, or tares; 4, barley; 5, clover; 6, oats. Unless the land be very clean and in high condition, the clover crop is too far removed from the cleaning and manuring process; otherwise the crops are well arranged. It would be desirable that one crop be eaten on the ground as an auxiliary manure to support constant cropping, as a leguminous crop is proposed in a similar course on clay fallows; and then the rotation would stand thus: 1, green crops; 2, barley, or wheat; 3, clover; 4, oats; 5, vetches, consumed on the ground; 6, wheat. And in five years, thus: 1, turnips; 2, barley; 3, seeds; 4, peas or tares, consumed on the ground; 5, wheat, or oats. Good lands, when well cultivated, will produce two crops of wheat in six years, and will not require the fallow manuring oftener than once, as it will have the benefit of a crop consumed on the ground. In some cases of very favourable situations the auxiliary manurings may be withdrawn; and if the fallowing for green crops occurs twice in six years, it is evident the rotation ceases. It is more pleasing to see a field under a crop of one plant than of many kinds; and if a farm be suitably divided, alternation may be accomplished without much subdivision in that respect.

These rotations apply to clayey loams of the very first quality; on those of an inferior description, and on the best turnip lands, rotations somewhat different are used, including grass for two years, where there are no grass or meadow lands for producing hay and pasturage for the live stock. A course of six years includes the following crops:—1, Turnips, or other green plants; 2, barley or wheat; 3, clover; 4, grass; 5, beans, peas, or tares; 6, wheat or oats, alternately on the fields. A course of five years is followed by omitting the peas and beans, and sowing oats as the fifth crop; or peas and beans may be sown in the fourth year, and followed by oats. A course of eight years has been recommended:—1, Turnips; 2, wheat or barley; 3, clover; 4 and 5, pasture; 6, oats; 7, tares; 8, wheat: or it may be limited to seven years by omitting one year of the pasture. These courses of cropping are adapted to loamy lands; and it may be very safely affirmed that no better are yet known.

The third division of soils that was mentioned consists of inferior loams, sands, chalks, and gravels. These lands are chiefly adapted for green crops, and for sheep feeding; and the quality in many instances not permitting the production of an average weight of the heavier roots, herbaceous and leguminous plants have been employed, which yield a maintenance for sheep, and consequently a manuring to the land. On the inferior turnip lands the following rotations have for a long time constituted a very successful practice:—1, Turnips; 2, barley; 3, clover; 4, pasture; 5, oats—and on lighter qualities of land, 5, pasture; 6, oats; and peas and tares may be sown on the grass turf, to supply the demands on the farm. The great advantages that are here derived consist in the vegetable remains that are accumulated for decomposition; and it has been found that land cultivated in this manner yields greater returns, both in grain and in animals, than when used in constant cropping of more than a usual proportion of the ameliorating crops and supplied with all the manures that the crop afforded. The land acquires a freshness and a consolidation from the rest it enjoys under pasture; but it supposes a dampnes in the soil and climate, to induce and favour the growth of grass seeds that are sown for pasture. In many cases of very hot and dry soils in the southern counties, it is nearly impossible to procure by any means a sward of grass; and hence the necessity of using the green crops for sheep feeding, and of sowing few grain crops, at least in a very diminished proportion. On hot burning sands, and on some chalks and gravels, a grain crop seldom succeeds. If the early months of the year be dry and hot, a total failure very often ensues, where autumn-sown rye would yield a much greater produce, both from its nature and from attaining a tall growth and forming a shade to the land before the scorching heats commence. The most inferior sorts of these lands will be most profitably cultivated by a succession of three or four feeding crops to one of grain for seed. Rye, winter tares, and summer-sown rape, may be succeeded alternately by turnips, rape, and spring vetches, and relieved occasionally by a crop of clover and corn.

On chalks, gravels, and sands of the better quality, a course may be adopted thus :—1, Turnips; 2, barley; 3, winter tares, consumed on the ground; 4, rape, also eaten on the ground; 5, spring vetches, also eaten on the land; 6, rye, for a seed crop—being four feeding crops to two of grain. Or, 1, Turnips; 2, spring vetches; 3, rye, for a seed crop; 4, winter tares; 5, rape; 6, barley —each grain crop having thus the benefit of two crops eaten on the ground. A crop of clover, sown at the rate of 30lbs. an acre, may succeed the barley crop; and may be cut or consumed on the ground, as may be required. The very inferior soils and burning sands may be used in a similar manner, with one crop of seed rye to four of the feeding plants; as :—1, Turnips; 2, barley or oats; 3, clover; 4, tares; 5, cole. Thus rye, winter vetches, turnips, spring vetches, and rye for feed, may be followed at pleasure by turnips, barley, and clovers, and the lands may be thus successively cropped by these plants, and kept in good condition.

Peaty soils, and lands that have been pared and burned, may be cropped in a similar manner, according to quality, and always with a large and full proportion of the feeding plants. On clayey soils pared and burned :—1, Turnips or cole; 2, oats or wheat; 3, grasses or tares; 4, peas or beans; 5, oats; 6, fallow; followed by wheat and grasses for several years. On thin clays :—1, Cole; 2, oats; 3, peas, beans, and tares, oats, or wheat; followed by cole, oats, and grasses, for several years. On chalks, sands, and peats :—1, Turnips or cole; 2, barley or oats; 3, 4, 5, grasses; 6, oats; 7, tares or peas; 8, turnips; followed by barley and grasses for a time. Or:—1, Turnips; 2, barley; 3 and 4, grasses or trefoils; 5, peas; 6, rye; 7, turnips; followed by barley and grasses.

The divisions of the different soils, as above-mentioned, will comprehend every possible variety; and it is presumed that the above rotations will be applicable in most cases with the variations that particular circumstances and fancies are known to require.

Experience has now fully established the fact that in a proper rotation of crops, a plant with a naked stem and a farinaceous seed should follow one with a branched stem and a fleshy root which has been taken from the ground without bearing seed; and if all these conditions cannot be obtained, that some one of them at least must be complied with. Wheat sown after clover, which is allowed to be the best succession on light soils, fulfils all the conditions; when it is sown after beans, the condition of the preceding crop not ripening the seed is given up, and consequently this succession is inferior to the other. It is not possible, however judiciously the land may be manured, to raise the same crop in a regular succession, without loss and detriment, both to the land and in the quantity of the crops. Wheat and clovers answer well in alternation, but not singly; and this shows that the same effect is not produced in the soil by these two crops. Experiments have been made by very many chemists, particularly by Macaire, of Geneva, at the request of Decandolle, the celebrated botanist, which lead us to suppose that in the formation of the seed or other nutritious parts of plants, the sap is digested; that it takes up certain elements, and deposits others, which are the residue of the process; and these being no longer necessary for the formation of the seed, are rejected by the vital action of the plant, and exude by the roots. Thus many inferior animals, which in many respects have some analogy with vegetables in their growth, as the "Polypi," take in nourishment by the same openings or pores by which the excrements are voided after digestion: and the different constitutions of different animals enable one class to feed on the excrements of another; whereas no animal in a healthy state can derive nourishment from that which it has already voided and digested. Our ignorance of the functions of vegetable life prevents us from seeing the effects produced on the sap by the expansion of the blossom and the ripening of the seed; but experience leads us to believe that certain plants thrive best after certain others—and that in this case they are always of distinct and different natures, and of different natural botanic families. Macaire and some other scientific men observed the change that took place in the water in which wheat had been made to grow. They formed a deposit in the water of the nature of bitter extract; and this they concluded to be excrementitious. Beans grew well in this water—and on the other hand, wheat throve in the water in which beans had grown. The effect of fallowing land is explained on the same principle; the excrement is washed out by the rains, or is decomposed by the light and air to which it is exposed by repeated ploughings. Thus the land is "sweetened;" an expression very common among the farmers engaged in fallowing. However interesting it may be to the curious inquirer to ascertain the real causes, it is sufficient for the practical farmer to learn by experience what crops do succeed best after each other, and how soon the same kind of seed may be sown again in the same ground with a reasonable prospect of its producing a good crop—and this, after all, can only be learned from actual experiment and observation.

ON THE WHEAT FLY.

From almost every district of Britain there are complaints of the wheat crop of the present year having been injured by the maggots of the wheat fly; we therefore embrace this opportunity of placing before our readers a few observations connected with this agricultural pest.

The wheat fly first attracted the notice of British naturalists in 1795, and some of their inquiries connected with this creature appeared in the third volume of the *Transactions of the London Linnæan Society*. No farther notices of the wheat fly seem to have been made public till about 1828, when communications on the subject, addressed to Mr. J. C. Loudon, appeared in the second volume of the *Magazine of Natural History*, by Patrick Sherriff and Archibald Gorrie, and to these individuals belongs the credit of having furnished nearly all that is yet known regarding the habits of this destructive insect. (See *Loudon's Encyclopædia of Agriculture*, paragraph 5066).

The wheat fly is a yellow coloured midge, small, in size, and of so fragile a nature that it seems unable to bear either the warm rays of the sun, or the force of a moderate breeze of wind. The insect generally reposes during the day amongst the lower foliage of the wheat plant, preferring sheltered situations, and may be best observed on calm clear evenings, after sunset, when it settles upon the ears which are beginning to emerge from the hose. The existence of the fly usually commences about the time of the wheat plant coming into ear, and terminates in a few weeks, having in the mean time deposited eggs in the blossoms.

The eggs produce maggots, which drop to the earth before the grain is ripe, and next season the maggots are transformed into the perfect fly; in this manner the race is continued from year to year.

The exertions of the wheat fly seem to be chiefly directed in providing for its offspring, and this object of the insect ought to be kept prominently in view when illustrating its habits, and devising relief from its ravages. By means of a long ovipositor the insect places its eggs on the inner chaff scale enclosing the furrowed side of the grain, and at the same time the anthers of the flower in which the eggs have been deposited are fixed to the style by means of a glutinous thread, and thereby prevented from passing in the natural way to the outside of the chaff.

The maggots are at first translucid, but soon become orange coloured; they seem to subsist on the pollen, and afterwards on the matter which would have formed the grain, without the power of moving from one flower to another.

The maggots of the wheat fly have many enemies, the most formidable being a black ichneumon, bearing a striking resemblance to a winged ant, and which has often been mistaken for the parent of the maggot. This ichneumon deposits its eggs in the body of the wheat-fly maggot, where they hatch, and ultimately deprive it of life. The common earwig also greedily devours the maggots, as well as some other insects which it is unnecessary to describe; thus nature often restrains the increase of her creatures by one tribe becoming the prey of others.

Any remedy which may be proposed for obviating the destructive effects of the wheat fly, ought to harmonize with the habits of the insect, or with the nature of the plant on which it is propagated, otherwise they can be of no value to the agriculturist. We have already alluded to the maggot of the wheat fly retiring to the earth, and again issuing forth as a perfect insect. Writers, however, differ widely on this part of the subject, some believing that the maggots enter into the pupa state before the ripening of the crop, and drop to the earth, and others assert that the pupa continues in the chaff until called into life in the following spring. Both of these parties are undoubtedly in error. We have often examined ears of wheat after the crop has been reaped, without ever meeting with a pupa of the wheat fly. We have also examined the dust and chaff which had been dressed out of a crop which had been injured by the fly, and all traces of the maggot which could be discovered were mere fragments void of vitality. Year after year in the month of March we have collected wheat-fly maggots in considerable numbers, and but little changed in appearance from the clods of ploughed fields which had produced a wheat crop in the previous year, and in the month of May we have witnessed the pupa of collected maggots covered with a transparent membrane through which the wheat fly was seen advancing towards a perfect state.

The plan of diminishing the numbers of the wheat fly by burning chaff which has been so often recommended by some agricultural periodicals of England can be of no avail, as the maggots retire to the earth before the ripening of the crop. Neither can much relief be obtained by sowing any particular kind of wheat, because all varieties are liable to the visits of the insect, which is led by instinct to select blossoms fitted for the rearing of

its young, without regard to the tender, hardy, or coarse nature of the plant. It has been observed that the fly readily propagates on the ears of the thick-rooted couch grass *(Triticum repens)*, which grows on the margins of our cultivated fields, and on examination we have found that every species of triticum, foreign as well as native, in the Botanic Gardens of Edinburgh, abounded with maggots of the wheat fly. With some red-chaffed varieties of wheat the ravages of the fly are not so obvious to the eye as with white-chaffed wheats; still they are found to be equally extensive, when both kinds are properly examined. There is, however, a variety known by the names Rivet, Cone, Anti-fly, and Pane's Defiance, which occasionally sustains little injury from the fly without entirely escaping. This wheat is late in ripening, and is much later in blossoming than other kinds which come into ear at the same time; but if the wheat crop of a whole district consisted of Rivet, the fly would still propagate as usual when no choice of variety existed.

The time of the wheat fly appearing in different years is in all probability regulated, like the growth of the wheat plant, by the temperature of the seasons. As a general rule, it will be found that the very early and very late portions of the crop are exempt from the ravages of the maggot, while all intermediate stages of growth sustain injury even when only one variety of wheat is sown upon a farm.

The causes which affect the appearing and disappearing of the wheat fly as a scourge of particular districts of country seem to be hid in mystery, and deserving of investigation. The earliest notice on this subject, with which we are acquainted, occurs in the *Modern Husbandman* for the month of August, by William Ellis, a Hertfordshire farmer, and is altogether so curious, that abstracts shall be given. "In 1740, the Thames was frozen over, by a two months' frost, and an ox roasted whole on it, as it was done in 1716, which was so severe as to enter the earth eighteen inches deep, in many places." "After this we had a melancholy sight, for as soon as the wheat had done blooming, vast numbers of small black flies attacked the wheat ears, and blowed a little yellow maggot, which eat up some of the kernels, in others, parts of them, which caused multitudes of ears to miss of their fulness, acting in some measure like a kind of locust, till rain fell and washed them off; and though this evil has happened in other summers to the wheat in some degree, and not done much harm, yet if the good providence of God had not hindered it, they might have ruined all the crops of wheat in the kingdom."

Here it may be remarked that our readers will recognize in Mr. Ellis's account the ichneumon fly which we have formerly mentioned, and that the maggots of the wheat fly do not remain long in the ears of wheat. It may also be remarked that the ravages of the wheat fly in Hertfordshire in 1740, as in many parts of Britain in 1855, took place after a winter of unusual severity, and that this coincidence of seasons may be held as conclusive evidence of frost not being destructive to the maggots of the wheat fly.

The *Edinburgh Farmers' Magazine* for 1808 and 1809 contains notices of maggots abounding in ears of wheat in agricultural reports of Berwickshire, Northumberland, and Perthshire. Mr. Gorrie estimates the loss sustained by the farming interest in the Carse of Gowrie alone, by the wheat fly, at £26,000 in 1827, at £30,000 in 1828, and at £36,000 in 1829. The same writer, in may 1830, thus depicts the prospect of the wheat crop in the Carse of Gowrie:—"The Cecidomyica are still alive in formidable legions. That the flies will this season be as plenty as ever is now quite certain: that they will lay their eggs in no other plant than the wheat genus is also true; the only chance of escape is in the time the pupæ appear in the fly state. Should this sunny weather bring them forward within a fortnight or three weeks from this date, the greater part will have perished before the wheat is in the ear, or should the earing take place before the flies appear, then only the late or spring-sown wheat will suffer; but these are slender chances. We know the history and habits of the insect too well to believe that either mist, or rain, or dew, or drought, will either forward or retard their operations, if the main body appear about the time the wheat comes in the ear." *(Loudon's Encyclopædia.)* In August, 1830, Mr. Sheriff thus writes:—"In the present year, throughout the months of June and July, there were few hours during which the wheat plant was dry, and the temperature was unseasonably cold; but the maggots of the wheat fly were actually less numerous than in the preceding year. A great portion of the eggs became addled, while the anthers remained fixed to the style—hence the unusual number of cups containing a grain and anthers. Ungenial weather also affects the number of maggots by preventing the depositing of the eggs, the fly being most active on warm serene evenings, and seldom seen during such as are wet, windy, or cold. In short, every observer of the wheat fly will conclude that cold cloudy wet weather during the existence of the fly is unfavourable to its propagation. The wheat fly seems to have decreased in numbers yearly since 1827, and as the friendly ichneumon is particularly numerous this season, the decrease is likely to be progressive." *(East Lothian Journal.)*

Here we have an account of a visitation of the wheat-fly in two of the most important wheat-

growing districts in Scotland, commencing in 1827. Between the attacks of the fly in that year and in the current one, there is the striking coincidence of both having been preceded by an abundant wheat crop in the previous year, and that there was a sudden increase to the numbers of the fly. On a farm in which we were interested the fly was unnoticed, and its ravages on the wheat crop unappreciable in 1826; yet in the month of June, 1827, myriads of fly were seen over the whole crop, and so great was the devastation committed by its maggots, that a field which produced a large crop of straw yielded less than ten bushels of inferior grain per imperial acre.

The most disagreeable feature of the devastation which has been quoted is the duration of the calamity, which extended over a period of four or five years.

Whatever may have been the extent of the wheat fly ravages in the present year, it would be idle to speculate with regard to its influence in time to come. We may however recommend all farmers whose crops have been much injured this season not to increase their wheat growing at the present time, as a crop either of barley or oats is likely to prove of more money value than wheat injured by the maggots of the fly.—North British Agriculturist.

PADIHAM AGRICULTURAL SOCIETY.

The anniversary dinner of this association was held at the Assembly Rooms, Padiham, Lancashire, on Thursday, Sept. 20, Mr. Le Gendre Nicholas Starkie, jun., presiding. Upon the platform were Sir James P. Kay Shuttleworth, the Rev. Mr. Whittaker, Rector of Whalley; Messrs. Littledale (Bolton Hall), John Brewer, William Waddington, Jesse Helm, and Thomas Hopwood. The annual show of the society had been held in the morning, and was considered to be the most successful of the six exhibitions since the commencement of the association.

After the usual preliminary toasts had been duly honoured, Sir J. P. Kay Shuttleworth, in proposing the health of "The Lord Lieutenant and Magistrates of the County," said: The Lord Lieutenant and the majority of the magistrates of this county are great landowners, and as such they have great social duties to perform. In connexion with associations such as the one which is assembled here to-night, they have duties of a nature deeply interesting to the members of such societies; and I think that associations of this character may be made chiefly useful, if we each, according to our ability, contribute that to the common stock of information which our opportunities best fit us to impart. My own acquaintance with agriculture is necessarily of a very limited nature. It is confined to those general improvements which are necessarily the function of the proprietor, such as the general drainage of estates, the improvement of farm buildings, and the introduction of those permanent means of advancement in the culture of the land, such as the means of storing liquid manure, and so on, which are properly the duties of a proprietor (Hear, hear). I have also felt it my duty, as I know it has been the custom of some of the gentlemen who surround this table, to make myself well acquainted with those improvements in science which affect the progress of agriculture. I mean such knowledge as is conveyed by books. And there is in one direction an opportunity, which I have possessed of late years, owing to the necessity of foreign travel for the restoration of my health; for I have been enabled to bestow much time and a good deal of minute attention on a comparison of the systems of foreign agriculture with that of British. What occurs to me, therefore, in relation to that which is the object of our meeting to-night, and that which I may say calls upon me to speak as a duty, as a magistrate and a proprietor in this county, is that which I can best do in connexion with the objects of this meeting—that I should, in some very brief and general terms, without at all descending into minute and fatiguing statistics, give you a slight sketch of what appears to me to be the great features of contrast between foreign and British agriculture. Now, I am very happy to say, at the outset, that in many most important respects the agriculture of England has made, especially in the present century, an enormous advance over that of our foreign neighbours. That advance has been owing to the application of some very simple principles in the breeding of cattle and in the culture of the land, and to these I will endeavour to direct your attention, because I think we may learn even from our past successes, and from having a clear idea of what are the principles of progress that we have hitherto pursued, and which have given us a great advantage over our neighbours, in what directions our efforts may best in future be turned. In the first place, anybody who travels abroad will be greatly struck with the vast difference which exists in the breeds of cattle in the various countries of Europe. It is very common, throughout the whole of Europe, to employ the cattle to an immense extent for purposes of labour. Almost all the farm work is performed by oxen, and likewise a very large quantity of the carriage of the continent is performed by oxen, and not, as in this country, by horses. Even in the case of a gentleman's carriage, abroad, when it comes to the bottom of a very steep hill, the relays at the bottom of the hill are not relays of horses generally, but of a long team of oxen, which drag the carriage to the top of the hill at a very slow pace. Now, there is one very great consequence of that which your own show to-day will at once make you aware of—that it has been the great object in the breeding of cattle abroad, to give great prominence to bone and strength, the means of labour, in preference to that which constitutes the great object of breeding in England—the smallness of bone, the early delicacy and precocity of the animal, the roundness of form, the bulk; and, instead of great capacity of labour, such bulk as is a great hindrance even to locomotion. Now, the way in which this great change in the character of the breeds of cattle in England during the last eighty or ninety years has been produced, has been by the principle of selection. Mr. Bakewell with respect to the Leicester breed, the Elmans with respect to the Southdown breed, and Mr. Collins with respect to the Cheviot breed, have produced an immense change, for example, in the sheep of this country. They have produced sheep with great rotun-

dity of form, with exceedingly small bone, with great weight, but with very small powers of locomotion; and the same principle has been applied to cattle, the short-horns, the Hereford breed, and the Ayrshire breed being all characterised by the same qualities of smallness of bone, the great bulk of carcase, and the large amount of meat that they will yield. In England, likewise, in reference to sheep, we have thought much more of the production of meat than wool, whereas in France and a large part of the continent agriculturists have paid much more attention to the production of wool than of meat; and one of the consequences has been that, even in England, seeing that we have preferred the production of meat to that of wool, the carcase of the sheep has been much larger, and therefore the fleece has been much larger, and in England the value of the fleece has been on the average as great as in France, whilst the value of the meat in England is double the value of that in France. The breeds of sheep and cattle produced in England have not, as I said before, been calculated for endurance of labour, as they are on the continent; and, consequently, they have had little bone; but they have been also breeds of great delicacy. The principle of selection has been precocity of growth; the breeds of sheep and cattle, with one exception, arriving at their maturity in two years, and they are ready for the butcher at the end of two years: whereas the breeds of cattle in France and on the continent generally are kept for many years for purposes of labour after they have arrived at the greatest growth. Therefore the whole consumption upon the farm for the maintenance of these cattle is simply expended in labour, and it was evidently a false economy which led the French to suppose that, whilst they were having the advantage of the cattle for labour, they were also getting some advantage of them in meat; for after two years, with an animal properly selected for the purpose, there is no increase in bulk, and it is better to kill the animal. Now, these principles, which are very simple—the principles of the selection of the breeds of cattle in England—are connected also with another very great change in England; that is, with the introduction of the rotation of crops, with the limitation of the extent of land applied to the purposes of growing corn, with the application of richer manures, with the keeping upon the land of the largest amount of stock, and, therefore, with the production of the largest possible amount of corn from the land. On the contrary, in France, and over almost the whole of the Continent, the plan of fallows still remains. The land is, to a very great extent, very generally much richer than that of England; there is a much larger extent of arable land, and it is land generally of a much more friable nature; and the climate is in every respect better adapted to the success of agricultural operations; yet, owing to the introduction of the system of rotation of crops, to the keeping of a very large amount of stock upon the farm, for the production of meat, and the application of these manures to a limited extent of arable land, the amount of corn produced on the same extent of land in England, as compared with the majority of countries on the Continent, is at least double, and in many cases treble, so that the much smaller extent of land produces the same quantity of corn. Now, the whole of these several operations singularly hang together. They are links of a chain of proceedings which can scarcely be dissociated; and it would be extremely difficult, I have often thought, for a French proprietor, in some remote part of France, to change the system upon which they are now proceeding, to introduce horses instead of cattle, and to feed his stock simply for the meat market. Even since they have introduced railways into France, it would be very difficult for him to do it; and we certainly owe a very large amount of our success—at least, of the rapidity with which we have introduced this system in this country—to the fact that we have markets so near at hand; that we have such a dense population; that we have such a little distance to carry our milk and butter especially, and that to a very large extent the farms of England can be dairy farms, and, where not so, can with such ease and advantage be meat farms. It would be more difficult to bring about this system in France; but so strongly are the thinking men of France convinced now of the great advantages of the system we pursue, that in the course of years I have no doubt whatever we shall see the English system rapidly introduced more and more over a great part of the continent. You perceive that we have valued our cattle chiefly on account of the milk and the meat they produced, and we have discarded that which is the least valuable portion of the contribution that the animal can make to the wealth of the country, and that is its labour, in respect to cattle which are fed upon farms; and we have valued less the fleece of the sheep than we have the meat, and the result is that the whole moneyed produce of the farms in England, on the good farms, is nearly fourfold that of the same extent of land, even of better land, in France. I connect these facts very much with the toast I have the honour to propose to you, and for this reason, that I think a very large part of the success of the agriculture of England has been owing to the good feeling which has subsisted between the proprietors and tenantry of the whole of England, to the extent to which the gentry of England have lived among their tenantry, and been ready to associate with them in such meetings as the present, and their readiness to pay close personal attention to the improvement of their estates; of which we had such noble examples as Mr. Coke (of Norfolk), the late Lord Leicester, the present Duke of Bedford, and many others whose names I might enumerate as examples of a class of proprietors who have spent their time, fortunes, and talents, which would have made them probably statesmen of the highest order, on the improvement of their estates and the welfare of their tenantry. I believe these results are to a very great extent owing to the attention the gentry have paid to the improvement of their estates, and likewise to the energy, skill, and enterprise of such men as Mr. Bakewell, the Elmans, and others, who have especially devoted themselves to the improvement of the different breeds of cattle in this country, and the introduction of right principles of culture. In connection with the toast, therefore, I think I am not introducing a subject foreign to the purposes of this meeting if I chiefly associate it with those duties which such gentlemen as the lord lieutenants and magistrates of counties have to perform upon their estates, in making great permanent improvements and in also cultivating right sentiments and proper associations for their tenantry. I do not think that sentiment, which is, I am afraid, somewhat gaining in this country, is a correct one, that the relations of landlord and tenant should be strictly confined to the mere terms of a bargain—that they should be reduced to the mere principle of self-interest. I do think that those associations which keep the tenantry connected through generations with a particular estate, which maintain sentiments of respect to the family to which that estate belongs, and confidence in the proprietor, are a happy part of our English constitution, and one of those features which we look in vain for abroad. Happily, this country has not been desolated by revolutions—happily, the estates of the great proprietors of this country have not very rapidly changed hands—happily, we have not introduced into this country that exceeding subdivision of property by which it has been cut up into small parcels, too small even for the comfortable support of families; happily there still remains

an opportunity, upon extensive farms and extensive properties, for the largest applications of capital, and for experiments which could not be conducted either by men of limited means or low intelligence; and, though I am the last person to desire that the land of this country should not be rendered more accessible to monied men, and even to the aspiring of the middle and lower classes, still I do congratulate the country that we have not given way, under the torrent of revolutionary principles, to any such sudden changes as have occurred abroad, which have broken up the estates of the country into divisions too small for the successful application of capital. One thing that strikes one's eye abroad very much is the extent to which the labour of women is introduced upon the land. That is owing to a very great number of circumstances which complicate the state of society abroad. You know that almost all the foreign countries have a system of conscription, or something equivalent to it, by which men are taken at a very early age to the army, where they acquire the habits of soldiers; and as they are taken early off the land, during their absence the women are obliged to labour on the land; and it is also owing to this subdivision of properties that the family has no chance of making a living out of the land unless the services of each member of the family, even the women, are given to its cultivation. The consequence is, that at the age of 45, or even at 40, the women are haggard, worn out with constant labour in the hot sun, from early morn to late at night, in the most laborious operations on the land. There is scarcely any kind of farm labour which they do not regularly perform; they hoe, they dibble, they weed, they even trench the soil; they load carts, and even drive them; and from morning to night such labour as this forms their habitual occupation almost all over the continent of Europe. Now, I think it is a very great advantage indeed to this country that that form of labour for women is rather the exception than the rule, and that even in the agricultural counties it is chiefly in harvest time, and to a certain extent in weeding and hoeing, but rather as the exception than the rule, that female labour is employed upon the land. There are a great many other features, as you will readily believe, of contrast between the English and foreign systems of agriculture, but I will not further intrude on your time than to say that the result of several years of observation has been to congratulate myself—and I am very happy indeed to find my opinions and convictions are supported by the most recent labours of political economists, and of men of high science who have visited this and foreign countries—that the system of English agriculture is one which not only contributes in a much larger degree to the wealth of the nation than that of foreign countries, but that it also contributes in a much higher degree to social contentment, to the maintenance of healthy relations between tenants and proprietors, and to that happy constitution of society which makes, as I think, and as I trust foreign countries also believe, the condition of England one to be envied by the rest of Europe (cheers).

The toast was received with much applause.

Mr. LITTLEDALE responded, and proposed "Prosperity to the Padiham Agricultural Society." He recommended most strongly, as the result of careful observation and experiment, the use of bones in different conditions as a manure, in preference to other kinds.

Mr. J. HARTLEY responded.

Sir J. P. KAY SHUTTLEWORTH said he concurred with Mr. Littledale as to bone manure, and recommended the introduction of a cross between the Ayrshire and shorthorn breeds as one likely to result excellently both as to meat and milk.

Several other toasts were subsequently received and responded to.

LORD STANLEY IN TIPPERARY.

At the first annual meeting of the Tipperary Agricultural Society—of which the Earl of Derby, who is connected by extensive landed property with the locality, is President—Lord STANLEY, in proposing the toast of the day, said: They were celebrating the first anniversary of the Tipperary Farming Society; and when he stated that, he might add that they did not come into collision with any existing society whatever. There was, some fifteen or twenty years ago, a small association established for the same purposes as those for which the present society had been formed. It was confined to two or three properties; the area it embraced was too narrow; its income, too, was small; and it was found that, year after year, the same persons gained the same prizes, and therefore it did not hold out an inducement to others to enter into competition; and the consequence was, it died a natural death. Then came the hard times—those times of trouble and distress which they never could forget, and of which they prayed there might never be a recurrence (Hear, hear). Those times brought a change not only in the ownership, but in the occupation of the soil—a change of which they had witnessed the commencement, but the ultimate result of which it was impossible yet to see (Hear). He believed it to be the inauguration of a new era for Ireland; and he was desirous, as they were all, that advantage should be taken in that neighbourhood of the opportunity for the improvement of agriculture (cheers). The first question they proposed to themselves in the formation of their society, then, was this: What extent of country should be brought within the operation of the society? There were some who conceived that it should embrace the whole county—or, at least, one riding of it. It was thought that this would have been advantageous in procuring a more extended patronage—in getting in more subscriptions—in causing an increase in the members, and in attracting towards the society more general public notice. But against these considerations they had others which prevailed, and they came to the resolution of limiting the area of the society to the union of Tipperary, and of basing it on those rules which whilst affording sufficient scope for competition among the wealthier class of farmers, did not exclude from the field of emulation the smaller and poorer class, in whose success they were equally interested (loud cheers). Local causes, no doubt, varied in each particular locality; but taking the general condition of Ireland, as respected agriculture, into consideration, they came to the conclusion that more advantages would be attained—that more practical good would be effected by a large number of small societies, in which the smaller and poorer could compete, than by a few large societies, in which competition should be confined to the wealthier (cheers). They had reason to say that the result of their experiment showed that they had met with some success, and he had every hope therefore of its permanency (Hear, and cheers). He had been going about among the

farmers for the last few days, and he found that many were not aware of its extent, scope, or what might be expected from its exertions; but he was certain they would soon perceive the beneficial effects of its operations. In England the effects of these societies, which had increased there greatly within the last few years, had given a decided impetus to agricultural science, and the improvement consequently was universal. Take an isolated case: a farmer, well to do, remained at home, content with what he had, and heedless as to how the world went on, unaware that there was any farm superior to his own, or any system of agriculture better than that which he and his neighbours had acted on. Not so with the farmer who had become acquainted with what was passing beyond the limits in which he resided—who knew what had been done to improve the soil—to improve cattle—to advance farming in every particular (Hear, hear). The last-mentioned farmer, actuated by that principle of human nature which will not permit the mind to rest where superiority is seen to exist, without an endeavour to emulate or excel, must endeavour to improve; with eyes and ears open, he returns to his farm with a determination to do what he can to make his farm as good as that of which he has heard, or which he may have seen; he finds that he had not been so very improving as he had imagined, and he sets about remedying defects of which he had no knowledge before (cheers). He would not speak from imagination or from fancy—he would not tell what he had seen and what they had seen, not only within the last few days, but years ago. They enjoyed an unparalleled climate, and a soil the most abundant in the world. They had seen fields and farms divided eight, nine, ten, twelve yards from side to side, with fences which were not only wasting all the land that might be used profitably, but a nursery for all those weeds which overran the fields, and for those blazing flowers of red weed which they knew so well, and which appeared like an overgrown crop in some localities. (Loud laughter, and cries of "Hear.") He had seen the farm-yard so well planned that all the refuse and manure of the yard and the pigstye drained into it—("Hear," and laughter)—thus not only wasting the manure, which might be placed to profitable account, but poisoning that water which might be a source of health and cleanliness to himself and his family. (Cheers.) He had seen whole families living in rags and in want on a miserable patch of land which was not sufficient to afford them sustenance for three months in the year—and they lived on that wretched patch in that misery and destitution, because they preferred the "dignity" of occupying land to the labour of earning a livelihood from others who could afford them employment. He did not talk of introducing costly and cumbrous machinery at weighty expense, such as they had in England. It would be difficult at any time to introduce machinery of that kind—their farms were too small for it—and they would continue, he believed, always too limited for the employment of such machinery as that to which he referred. These were evils to be remedied—but they were not of a nature that could not be easily removed by the application of that common sense which was so natural to the Irish people. (Cheers.) It was a calumny to say, as some had said, that the peasantry of Ireland were naturally idle. He did not believe that—he repelled that calumny (cheers). Who was it that made the railway? Who was it that dug the canal? Who was it that did all the hard work that was done in all the great towns in England? Who was it that cleared the new lands in America, and removed the forests? Who did all these things? In nine cases out of ten, he was prepared to answer, it was the Irish peasant (cheers). Who had improved every country in the world but his own? If he went back to causes for this state of things, no doubt he could find them. If he went back to causes, he could, he repeated, find them; but in stating them he should say something that would not be agreeable to all, or practically useful at the present moment. He believed that much of the misery they had to deplore was caused, not by one class, but by all classes, and that all were equally in fault. He would say let by-gones be by-gones. He believed that a new era had opened for Ireland, and that they would now consult their own duties by taking immediate advantage of its advent (cheers). Let them use only half the energy in the good work which they had wasted in feuds and in factions—in political sectarian dissensions—let them, he said, do this, and they would go far to make Ireland what God and nature intended her to be, and what man had hitherto prevented her from becoming—the garden of Europe, and of the world (loud cheers). The noble lord gave, amid prolonged applause, "Prosperity to the Tipperary Union Farming Society."

LORD ALBEMARLE AND THE PROPER CELEBRATION OF THE "HARVEST HOME."

The Earl of Albemarle has undertaken the task of reforming the manners of the Eastern Counties. We heartily wish him success in his praiseworthy endeavours, and from the spirit in which he has commenced operations, and the hearty acquiescence in his views displayed by his country neighbours, we should be disposed to anticipate favourable results. The great stain of social life in England among the humbler classes has been drunkenness. It is "the Bottle" which is the cause of three-fifths of the crime and poverty and misery perpetrated or endured by the English peasant and artisan. The judges of the land, the men of all others the most conversant with the pathology of crime, take even a larger proportion. Lord Albemarle, in his address to his rustic audience the other day at Banham, which was inserted in our columns a few days back, quoted the *dicta* of some among these great magistrates. "Not a crime comes before me," said Mr. Justice Coleridge, "which is not directly or indirectly caused by drinking." "If it were not for this drinking," said Justice Patteson a little while back, in the course of an address to the grand jury in Norfolk, "you and I, gentlemen, would have nothing to do." Baron Alderson follows:—"Drunkenness is the most fruitful cause of crime; if it were removed this large calendar would be a very small one." Judge Wightman last year, being on the Norfolk Circuit, confirmed the statement of his yoke-fellows of justice: "I find in this, as in every other calendar, that one unfailing cause of *four-fifths* of the crime is drunkenness." We must pause in our extracts, not from want of matter, but of space. Surely this is a fearful state of things. We are very confident that the experience of the metropolitan and other urban magistrates would completely confirm the

statements of the judges, which may perhaps have been more immediately directed to the causes of crime in the rural districts. There is not one per cent. of those atrocious cases of wife-beating which are recorded in well-nigh every police report which appears in our columns which has not its origin in drunkenness. The husband invariably, and sometimes—we grieve to write it—the wife, is an habitual drunkard. Half-a-dozen wretched little children are condemned to pass their earliest years in the foul room in which scenes of bestial debauchery are day by day and night by night enacted. The air is foul with obscenity and blasphemy, as well as with physical pollution of every kind. One act of violence follows another—the children are sometimes the victims and always the spectators—until the time comes at last when the drunken brute staggers home more mad than his wont—there is a scuffle and an agonized prayer for mercy, a curse and a finishing blow. The little wretches cower under their ragged counterpane, lest their turn should come next. The first yellow streak of a London dawn gilds a bloody puddle on the garret-floor. The woman's sorrows are at an end, while her jovial husband, the Prince of Good Fellows at the gin-palace—the man whose presence was so acceptable in the tap-room—has not yet snored off the insensibility from which he will awake to find himself a murderer. Then come in the half-wakened, horror-stricken neighbours—the sharp policeman with his bull's-eye and his universal suspicions. The man and his children are dragged off to the stationhouse, and it is one of his own little ones who, in all probability, will give the evidence necessary to consign the jolly toper to Calcraft's care. *Evoe Bacche!* There's nothing like gin.

Lord Albemarle has set to work in earnest to diminish this abominable vice in his own district. There was to be a harvest-home among his neighbours down in Norfolk. The East Anglians hitherto have been in the habit of displaying their gratitude to the Almighty for His abounding mercies by getting beastly drunk. Their thank-offering was in the nature of a human sacrifice, for they sacrificed themselves. It seems, however, possible to give another direction to the simple piety of these grateful rustics, and this is the task Lord Albemarle has undertaken. He collected all his neighbours, to the number of some thousands, as we conclude from the accounts, persuaded them to bring their wives and their children, and organized a tea-drinking on a gigantic scale, with plenty of edibles, plum-cake, &c. When they had all eaten and drunk their fill, Lord Albemarle addressed them at considerable length, and entreated them, for their own sakes and for the sake of their families, to give up the abominable custom of celebrating their harvest homes in the alehouses and beershops. The custom was, that when the harvest was got in, the county of Norfolk got drunk. From this followed naturally the consequences to which the judges alluded in their charges to the grand juries. The problem, of course, is to persuade the labourers to substitute one form of rejoicing for another, for any attempt to extinguish the annual merry-making altogether would certainly end in absolute failure. From the time of Thespis, when the Athenian rustic smeared his face with wine lees, and contended with his fellows for the goat prize in rude satyric strain, till our own days, when the East Anglian clown esteems it a solemn duty to drown his lethargic intelligence in muddy beer, the conclusion of harvest has among all nations been the occasion of mirth and festivity more or less innocent Nowhere, however, has the custom been more absurd than in Norfolk. It seems that the habit is, when the harvest is well-nigh complete, that some trusty topers—the Anakim of drunkenness—twenty-five-pint men, are deputed to go round among the farmers, and solicit "largesse." The term is borrowed from the herald's jargon, but to the apprehension of our Norfolk friends it implies ways and means for getting drunk. When the contributions have attained the necessary amount, and the last wain, piled high with the yellow honours of the merry crop, has been ushered to the farm-yard amidst the loud huzzas and rough jokes of the countryside, the East Anglian peasant addresses himself seriously to the business of getting drunk. The desired consummation is, of course, soon attained; and then commences the chapter of fighting, wife-beating, murder, and so forth. As though to give point to Lord Albemarle's words, a day or two after he had delivered them a horrible murder was perpetrated near Yarmouth, the consequence of these intemperate harvest-homes. It was on the evening of Saturday se'nnight that a number of harvest labourers went into the King's Arms public-house at Caistor, near Yarmouth. They remained drinking in the public house to celebrate the joyful occasion until 12 o'clock, when it was closed. When they got out in the open air, many of the party were drunk. A fight was the consequence, but they were persuaded by a constable to disperse. One man remained, appearing inclined to fight anybody. A labourer, named Robert Green, unluckily for himself, happened to be passing homewards at the time. When the drunkard caught sight of him he staggered up to him, and felled him with a blow, as a butcher might an ox. Poor Green fell down, hurt to death. Joseph Underwood, the murderer, could only plead in excuse that he had drunk twenty pints of beer in honour of the harvest-home.

Such is an example of what follows from the genial festivities with which the Norfolk rustics have hitherto been in the habit of celebrating the conclusion of their annual toil. It is no slight service which Lord Albemarle has attempted to render to them and to the country. He told them that his park was open to them on such occasions, but they must bring with them their wives and children, and he and his family would do their best to make the day a happy one to all. This, too, was said with an utter absence of that offensive affectation which renders the courtesies of a patron to his humbler neighbours rather a nuisance than a favour. There was nothing of the Glendower twang about his hearty, manly speech; and we can well understand that it should have produced a thousand-fold more effect than hours of groaning, exhortation, and sour rebuke. If the humbler classes are to be redeemed from the vice of drunkenness, this is the way to set about the good work. Let every man whom Providence has blessed with rank and wealth—in ninety-nine cases out of a hundred by no merit or exertions of his own—remember that he must one day render an account to Heaven of his stewardship. He will be most surely held accountable not only for the evil he has done himself, but for the evil which he might have prevented, and did not prevent. Woe to him if his influence has not been exerted for good, or if he permits himself to drift down upon the notable opinion that he is a chosen vessel, entitled therefore to treat his fellow-creatures with superciliousness or with the pride that apes humility. Yesterday was set apart for a national act of thanksgiving; we leave it to the consideration of all persons who have been blessed by Providence with ample means and a higher cultivation of intellect if they could give better proof that the solemn words of gratitude yesterday employed in our churches were not mere lip-service than by following the example of Lord Albemarle.—Times.

BAKEWELL FARMERS' CLUB.

The seventh annual meeting of this society was held at Bakewell on Thursday, Oct. 4, under auspices far more successful and encouraging than for some time past, both as regards the patrons of the exhibition and the quality of the stock exhibited. The cattle market was again adopted as the show-yard, through the kindness of the Duke of Rutland, who had kindly placed it at the service of the society. The most striking feature in the exhibition of stock was the display of milk cows, than which a more superior class of animals were never brought together. This society, through the instrumentality of Mr. Laurence Furniss, the obliging secretary, gives promise of a career of success and usefulness. It has diffused a vast amount of information amongst the agriculturists of the county, and now the tenant-farmer adopts ideas for improving his farm which a few years ago he ridiculed and disbelieved. The landowners of North Derbyshire have given it their countenance and support, which, with the present board of management, cannot fail to have its good effect on the prosperity and usefulness of the institution. The judges were, for cattle, Mr. Dickin, of Mansfield, and Mr. Kirkham, of Newhaven; for poultry, Mr. Faukner, of Bretby Park.

At the conclusion of the show between sixty and seventy gentlemen sat down to an excellent dinner. W. P. Thornhill, Esq., M.P., president of the society, occupied the chair, and the vice-president, Sir Joseph Paxton, filled the vice-chair. Amongst the company we observed the following:—Lord Denman, R. W. M. Nesfield, Esq., H. Barker, Esq.; G. Paxton, Esq.; S. Smithers, Esq.; W. Longsdon, Esq.; Rev. Courtnay Smith; Mr. Hudson (secretary to the Royal Agricultural Society of England); Mr. W. Jepson; Mr. R. Sybray; Mr. Samuel Sybray; Mr. Clayton; Mr. Wain; Mr. Pursglove; Mr. Evans; Mr. Furniss; Mr. L. G. P. Mortimer; Mr. John Mortimer; Mr. Jas. Greaves; Mr. W. Greaves; the "Judges" (Mr. Dickin and Mr. H. Kirkham); Mr. R. White; Mr. Owen; Mr. Hayward; Mr. Bower; Mr. Leech; Mr. Smith; Mr. Mellor; Mr. Dale; Mr. Robinson; Mr. Bradley; Mr. G. Gould; Mr. W. Gould; Mr. B. Swaffield; Mr. Clarke; Mr. Mason; Mr. G. Bagshaw; W. Darwent and Co.; Mr. Tagg; Mr. Redferne; Mr. Goodwin; Mr. James Robinson; Mr. Askern (of Rampton); Mr. Ward; Mr. Wilson; Mr. Young; Mr. Price Bennetts; Mr. Roe; Mr. Gould (of Hanson); Mr. Wilton; Mr. Gratton; Mr. Hunter.

After the usual loyal toasts, Lord DENMAN, in a highly eulogistic speech, proposed the healths of Colonel Leslie, W. Evans, Esq., of Allestree, Mr. Bateman, and Mr. Hudson, Secretary to the Royal Agricultural Society of England.

Mr. HUDSON, in responding, said he felt deeply affected at the kind manner in which his health had been proposed and drunk. Fifty years had now elapsed since he first drew his breath in that lovely valley of the Derbyshire Wye, in which the ancient Saxon town of Bakewell was situated, in that vale "in whose bosom the bright waters meet;" and after the long course of his busy life, he again once more found himself, with indescribable pleasure, among the scenes of his youth, and in the society of his early friends (Hear, hear). As the Secretary of the Royal Agricultural Society of England, he begged also to thank them for the honour they had done him in connecting his name with that patriotic body. Every farmers' club, he thought, and every agricultural association throughout the kingdom, must naturally feel a deep interest in the success of the Royal Agricultural Society of England; for it was the result of their own practical experience, and the independent representative of their own practical interests: it was an institution established by the united co-operation of the land-owners and the land-occupiers of England; not for their own individual and immediate interests, but for the promotion of improvement in every branch of husbandry, for the increase of our national resources, and for the common interest and good of our country (loud cheers). It was not an academy of dictation to farmers, affecting to instruct them in the management of their affairs, by the promulgation of abstract dogmas or the recommendation of new theories; but it was the focus of a great system, collecting from remote sources the scattered rays of practical experience, and again diffusing them with increased intensity and effect through every region of the agricultural world; or the powerful heart, which maintained in vigour the circulation of the life-blood through the several organs of the agricultural body (loud cheers). It had been established, not by a Parliamentary grant, but by the voluntary contributions of many thousands of the most distinguished friends of agriculture in this country; and its recommendations had never, he believed, been made, unless founded on the most careful scrutiny of their practical tendency, and the economy of their application. (Hear, hear). One of the great results of the Royal Agricultural Society has been the revival of old agricultural bodies, and the establishment of new ones. Among these, none were, he believed, capable of supplying facts of more direct practical value than the farmers' clubs throughout the country, which in their very formation evinced that desire for improvement which was to be derived from association and discussion. (Hear, and cheers). Of these clubs, none could have for him personally a greater interest than the farmers' club of his native town, at whose annual meeting he had then the gratification of being present; and he witnessed with real pleasure and pride the spirit with which its objects were being carried out, and the striking results which it had already obtained (loud cheers). His best heart's wish was, that it might continue to prosper, and that, as the Secretary of the Royal Agricultural Society of England, he might be favoured by it with many future results of its operations; and have many opportunities, in his official capacity, of receiving and carrying out from time to time the wishes of its members on any point connected with their operations or discussions; and as among the members of the club he might number so many of his old friends, he begged to assure them with how much delight he would at all times receive their communications. (Mr. Hudson resumed his seat amid loud and long-continued cheering).

Shortly afterwards Mr. J. H. Baker proposed the health of Sir Joseph Paxton, their Vice President.

Sir JOSEPH PAXTON, on rising to respond, was loudly cheered. He said: Mr. Chairman, my Lord, and Gentlemen, to say that I thank you is a feeble expression. I assure you on this occasion I feel the reception you have given me so much that I cannot give adequate utterance to what I would wish to say (Hear). It is true I have been amongst you thirty years next May, and though a much larger portion of my time has been spent elsewhere, I consider myself as much a Derbyshire man as any man at this table (cheers). I came among you in

a very much more humble capacity than I now hold. I came full of health, full of life, and full of vigour from the south, and I thought, perhaps, as every young man thinks, that I knew almost everything (cheers and laughter), as I had been in a good school, and had had opportunities of seeing all that had been done for the improvement of my profession (Hear). I should tell you that my father was a farmer, and that in early life I was brought up in the farm-yard. I am essentially, then, a Farmers' Club man (Hear, hear). But I took to other occupations, and, through perseverance and determination, I became successful, and had the good fortune to be selected to come to Chatsworth. I was rather conceited at this; I don't mean conceited in myself, but in the system of cultivation I had learned; but when I came to Chatsworth I soon found the cold bleak hills of Derbyshire different to the climate of the south, and this soon brought me to the study of what to do to get out of this difficulty. When first the Duke of Devonshire engaged me, and he engaged me himself, he told me Derbyshire was a beautiful county, but not a very fertile one—that at Chatsworth they never had any flowers and very little fruit; but in a few years we contrived to have flowers and fruit in great abundance. I became a farmer when first I came to Chatsworth, and never made so much money at one time as I did out of a cow I bought. I happened to be going to Chesterfield, and saw a good cow in a field, and went direct to the owner of the farm, and purchased the animal for 15*l.* out of the field, and sent it direct home (cheers and laughter). I kept an account of that cow's produce for four years, and it paid me an average of 30*l.* a year. I was not here in time to see the stock to-day, but I believe I am the breeder of the bull which has taken the first prize. I have always taken an interest in practical agriculture in a national point of view, and have looked at these institutions as the best means of imparting instruction to the farmer (cheers). The Highland Society of Scotland had the same sort of meetings as the Royal Society of England, which was founded on the principles of the Highland Society. The Royal Society of England was a most excellent institution, and deserved not only the patronage of the gentlemen of England, but also the patronage of the farmers, because it has the valuable quality, referred to by the worthy secretary, of not being dogmatical upon farmers or other parties. That was the pinnacle of fame in farming (Hear). They had once a North Derbyshire Agricultural Society, which held its meetings once at Chesterfield and once at Bakewell; but, generally speaking, Mr. Swaffield and some few other high farmers sent stock bred at a great expense, so that the tenant farmers could not compete with them (Hear, and cheers). These farmers' clubs, therefore, gave advantages which the other society did not, because they knew that the stock exhibited was the production of their neighbours. Some farmers were disheartened, and said such a person is too successful to compete with. But that is not the way to deal with the question; their aim should be, go home and do likewise; and don't be afraid of the competition of Mr. Furniss, Mr. Jepson, and other farmers. With respect to North Derbyshire, a man may be farming down in the valley, on the hill, on limestone, gritstone, or his land may be badly drained, and he may have to contend with other difficulties; and, therefore, in looking at those farmers' clubs, you must have reference very much to the position in which a man has cultivated his stock for exhibition. (Hear and cheers.) As far as agriculture goes, it is quite impossible for a district twenty miles off to know how things should be treated here. One of the judges, Mr. Dickin, gave you good advice, but he happens to live in the neighbourhood of Mansfield, where the climate is warm; but let me tell him that if he brings his early sowings here, he will find they will rot in the ground. (Hear.) The great principle to look at in agriculture is this: first of all, from nothing nothing comes. If you attend to the land here, and sow the crops upon it at a period suitable to the climate, these crops will be perfection of their kind; but if you sow them at an unsuitable period, there will be no crops. All plants of a similar structure to corn require a given temperature in order to come to perfection; and it is whether you get very much below or above it that your success depends, because with corn grown at a lower temperature than its nature requires, the seed becomes husky and the corn of little value (applause). The farmers in this county have improved more than in any other, and they deserve great praise for their exertions. (Hear, and cheers) They are satisfied that they must rest on their own energies, and work out their own salvation in farming, and not depend upon the legislature for anything (loud cheers). They have fought through bad times like men. What I have told you about plants applies equally to cattle. You cannot keep cattle too warm, and the great secret of feeding is to go gradually on improving every pound of flesh until you give it into the hands of the butcher. I am always ready and most desirous to assist, as all the agents of the Duke of Devonshire are, to give improved facilities to farmers; but the error which most farmers fall into is, as Lord Ashburton said, "Men learn a great deal, but they don't learn common things." (Hear, and applause.) He frequently saw farmers leave their cattle too much exposed; whereas by the use of a little thatch, which might be made at a small expense, they might keep them warm, and this precaution would repay them five-fold (applause).

LANDLORDS ON THE DUTIES OF LANDLORDS.

It has been satisfactory to remark, as we have often had occasion to within these last two or three years, how greatly the agricultural gatherings which fall at this season have improved in their tone and character. The closer, in fact, they have been confined to their legitimate object the more useful and effective have they become. The bitterness of party spirit and the unprofitableness of class contentions have happily been suffered to die away. It will always stand to the credit of the farmers of this country that they themselves were the first to promote this better understanding, and to let by-gones be by-gones. They have had ample opportunity had they chosen to act otherwise. Many a platform orator has since taunted them with the correctness of his opinions, and the overthrow of their principles. The almost invariable answer to this has been silent contempt. The agriculturist has had something better to do in fitting himself to the altered circumstances of his case, and doing all he could to keep pace with them. It has so happened that many collateral

and but little foreseen events have come to his aid in this honest endeavour. Still, the thanks of the country are no less due to him. If a certain course of policy must be the best for the majority, the readiness with which he not only submitted to it, but the energy with which he strove to maintain his position under it, should all tend to secure him the gratitude of its promoters. The farmers now are said to be doing well. At any rate they deserve to be; for no class has of late years laboured more earnestly to advance and develop the full capabilities of their calling.

We repeat, this has been very remarkable in all said and done by them at their own meetings. The uncertainty once removed, the last hope, if it may be, destroyed, and the tenant-farmers straightway took the initiative as to "what has to be done now?" There was no idle lamentation, no useless expression of dissent. They saw the experiment was to be tried, and they resolved to give it the best and fairest trial they could. We really believe that since the repeal of the corn-laws there has been more practical and profitable discussion amongst the farmers themselves on the merits of their own business than ever previously occurred in anything like the same, or double or treble the period of time. It is only right to say that those most directly associated with them are gradually coming to adopt the same course. It is not only the tenant now who considers with his neighbour how they can best fulfil the duties of their station. It is not even the landland who volunteers only to impress upon them what these duties are. He feels that he has many of his own that may yet bear a little closer discussion; and with his brother landlords, and in the presence of his tenants, does he proceed to consider what these are.

We have already had occasion to record how favourably the autumn gatherings have in this respect commenced. Lord Stanley, at Liverpool, boldly spoke to the hampered conditions on which too much of the land in this kingdom was held, and the impediments so offered to its proper cultivation. Crossing the Channel, his lordship has followed this up with another good address on agricultural matters, which we give in another page. The subject of this, however, will be found chiefly, if not altogether, applicable only to the people to whom it was addressed. The small holdings requiring associations of a proportionately limited area—the unparalleled climate and soil, with the little justice yet done to it—the wretchedness, misery, and impediments to improvement offered by those who prefer "the dignity" of occupying land to the labour of earning a livelihood. All these, with his proverbial industry abroad, and his energy in feuds and factions at home, are but topics of consideration for the man of Ireland, as on him we should hope Lord Stanley's speech will not be without its beneficial effect.

In England the duties of the landlord have been followed up by one of the chief speakers at the meeting of a neighbouring association. From Sir James Kay Shuttleworth, over the dinner table at Padiham, we hear of "those general improvements which are necessarily the function of the proprietor, such as the general drainage of estates, the improvement of farm-buildings, and the introduction of those permanent means of advancement in the culture of the land, such as the means of storing liquid manure, and so on, which are properly the duties of a proprietor. I have also felt it my duty, as I know it has been the custom of some of the gentlemen who surround this table, to make myself well acquainted with those improvements in science which affect the progress of agriculture: I mean such knowledge as is conveyed by books." This is all very good as far as it goes, and may be very safely taken as a text-word by other landlords. With part, however, of what follows in another place, we cannot so cordially agree. "In connection with the toast"—the Lord Lieutenant and the Magistrates of the County—the same speaker thinks: "I am not introducing a subject foreign to the purposes of this meeting if I chiefly associate it with those duties which such gentlemen as the lord lieutenants and magistrates of counties have to perform upon their estates, in making great permanent improvements, and in also cultivating right sentiments and proper associations for their tenantry. I do not think that sentiment, which is, I am afraid, somewhat gaining in this country, is a correct one, that the relations of landlord and tenant should be strictly confined to the mere terms of a bargain—that they should be reduced to the mere principle of self-interest."

With the latter part of this, and of course only the latter part, we entirely disagree. The sentiment referred to, which undoubtedly *is* "gaining ground," is, we believe, as indisputably a correct one. If the agriculture of this country is to be further improved and developed—in other words, if more capital is to be employed in the pursuit, its use cannot be made too much a plain matter of business. It is this want of terms, or of a proper understanding to commence with, that has tended so much to retard our advance. We should be the last to see the good feeling existing between landlord and tenant in any way endangered. We are convinced, however, that these very "terms of a bargain" would have a precisely contrary effect. It is the blind bargain, rather, when a man never knows what he is to get, and is so generally disappointed in what he does receive, that breaks up

the good feeling between man and man. One of the very first, in fact, of a landlord's duties, is to make himself acquainted with these matters of business. The more he knows of them, the more will he approve of them; while it is very certain, as Sir James Shuttleworth says, the sentiment is, and long has been, "gaining ground."

The comparison between English and French farming is very nicely done, and will just now be read with much interest. It confirms in a great measure what M. Lavergne has already said of his own country, in making the same estimate; that is, it tells dead against our neighbours. Whatever some of our Deputation at the recent Exhibition may have thought, and however sincere their expressions, it does not seem that we must expect too much from trying foreign crosses, or the adoption of foreign systems.

THE FATTENING OF CATTLE AND SHEEP.

At the last April monthly meeting of the Winfrith Farmers' Club, Mr. J. Dunn, of Bisterne, Hants, delivered the following most excellent lecture, which will be read with great interest by our readers:—

I offer no apology for appearing here this evening, following a pursuit to which I am enthusiastically attached. It always affords me pleasure when chance leads me into the company of those from whom I can glean an idea. Such, I hope, will be the case to-night. I am come to learn, not to teach—although my method of supporting the character of learner may be a new one. I hope, however, that you will not be backward in detailing your experience on the important matter which forms the subject of my remarks, viz., the fattening of cattle and sheep. It is well known that the same description of crop cannot be repeated on the same piece of land in uninterrupted succession; the soil may be exhausted of the particular elements necessary to produce a crop of wheat, and yet contain sufficient of those which are required by grasses, roots, or pulse, and hence our rotation system of cropping. To restore fertility to their exhausted fields, our ancestors were in the habit of exposing the soil for a season to atmospheric influence, frequently stirring it meanwhile: this method of restoration has, however, nearly become obsolete. The substitution of green crops for naked fallows is now a rule with few exceptions; and on those damp and heavy soils where they are still found lingering, draining, subsoiling, liming, &c., are year by year removing their circle, so that the practice of summer fallowing bids fair at no distant day to be numbered with the things that were. To repay the expenses incurred in the cultivation of green or cattle-food crops, forms, therefore, a first reason for having live stock on our farms. The soil in its normal condition may possess a capability to produce 16 or 20 bushels of wheat per acre; but in order to increase the produce above the normal ratio, there must be deposited in the land the material whence this extra produce is to draw its support. The excrement of fatting animals is rich in these materials according to the quality of their food, and hence we have an inducement to the practice of fattening which so extensively prevails among our best farmers. It is admitted that the substitution of a green crop for the naked fallow is the greatest improvement of which modern agriculture can boast—and deservedly; for if the difference in value of the stock so consuming these crops be increased equal to the cost of their production, the agriculturist of the present day is in a much better position than his predecessor; for while the fallow system left the land in debt to the succeeding crop, the modern cereal finds it in a condition happy in the extreme, viz., free from all previous burdens. Not only do the growth and consumption of a green crop answer all the purposes of a fallow, but it excels in the quantity of the after-crops: so well is this known, that in some counties an estimate of a man's abilities as a farmer is made solely by the quantity of live stock which his farm is made to maintain. I am well aware there are those who, from not understanding well the principles on which to manage fatting stock, have come to the conclusion that the system is one not attended with those advantages which its promoters claim for it, and therefore I confess that the seemingly startling exclamation of one of our amateur teachers, a few months ago, did not take me altogether by surprise. The gentleman to whom I allude has learnt, in the deep gloom of hopeless disappointment, the sad result of his experience in fattening, to look on live stock as only necessary evils, mere manufacturers of manure, and unattended with any direct profit; such a climax, arrived at by a gentleman who certainly does not hide his candle under a bushel, could hardly fail of being the means whereby much discussion on the profitableness of fattening animals would be raised; whether, therefore, I looked to the subject in a controversial light, or regarded it for its practical utility, I felt certain that it only required to be named for discussion here, to meet with a warm approval. The materials which form the flesh, bone, and fat of animal bodies, are not compounded up from whatever indiscriminate mass finds its way into the stomach; the nutritive process is much simpler than that—it consists simply in an elaboration of the constituents of simple substances which are contained in the food. Physiologists have divided these substances into two distinct classes, each of which is necessary to support animal life, and each of which performs a different office in the system; so distinct are the nature and and offices of these elements of nutrition, that a dog fed on one only would speedily die of inanition. These elementary substances are designated the carboni-

ferous or heat-producing elements, and the nitrogenous or flesh-making elements. The seeds of grain and the different kinds of grasses and roots all contain them in different proportions. Thus—

Clover hay contains	44	per cent. carb. and	9 nitr.
Oats	51		11 „
Beans	42½		26 „
Peas	52		24 „
Barley	54½		13-3 „
Swedes	14½		2 „
Linseed	55½		20 „

At every inspiration of air by the lungs, a certain quantity of oxygen is inhaled, and at every expiration a certain quantity of carbonic acid is exhaled; the union of the inspired oxygen with the carbon and hydrogen of the system gives rise to the heat of the body; to supply the demand thus occasioned for carbon, that in the food is required; and whatever amount of carbon there is in the food over and above that which the respiratory process requires, is either deposited in the form of fat, or else passed off in the excrement. It is thus evident that carbon is a highly important agent in supporting animal life, and that whatever tends to lessen the consumption of it, in maintaining warmth, will tend to the more rapid accumulation of fat. This explains why warmth is, to some extent, a substitute for food, and shows that the very first thing we have to attend to, in fattening animals, is to keep them warm by artificial means. But the carbon in the food is liable to a certain degree of waste from the defective organic structure which our unimproved breeds of both cattle and sheep labour under. The quantity of carbon consumed being in proportion to the quantity of air inspired, and the quantity of air inspired being in proportion to the size of the lungs, it follows, as a matter of course, that an animal with very large lungs will not leave so large an amount of carbon in the food to be deposited as fat from the same quantity of food as one with smaller-sized lungs. This fact has received abundant confirmation from the appearance presented by the lungs of our best fattening breeds of both cattle and sheep, and which can be studied to perfection at any butcher's shop where the Leicester and coarse-horn are both killed. There is a certain amount of oxygen required to maintain life, and so it is for the consumption of fuel in our grates; but if we open the doors and windows of a room, although the fire will burn much fiercer, there will be much less heat diffused throughout the room. Now precisely in this manner an unduly-sized lung affects the animal system; it inspires much more oxygen from the atmosphere than there is required to combine with carbon to keep up the heat of the body, and consequently the food is thus far wasted—it is, in fact, burned, yet produces no benefit. It is apparent from this that to know from external characteristics whether an animal is possessed of a large or small lung is no unimportant piece of knowledge to the stall-feeder; this he can do by observing the form of the chest; a deep narrow chest is a certain indication of a large lung, and a round wide chest is an equally certain indication of a moderate-sized one: everything indicative of muscular development indicates a large lung, consequently no really good judge of a fatting bullock ever selects animals with deep narrow chests, or with very powerfully-developed muscles. The nitrogenous constituents of the food, unlike those of which I have been speaking, have no function to perform other than to supply the wants of exercise and growth; these are the elements whence the fleshy tissues are derived, which tissues are merely organised fibrin. Fibrin itself is simply liquid flesh, or the albuminous portion of roots and grain converted into organised matter. The composition of albumen from ox-flesh is—

Carbon	54.12
Hydrogen	7.89
Nitrogen	15.67
Oxygen	22.32

The composition of legumen from peas is—

Carbon	54.14
Hydrogen	7.16
Nitrogen	15.67
Oxygen	23.03

We see, then, that albumen is so closely identical in its composition, whether it be obtained from peas or ox-flesh, that one can hardly distinguish any difference—its appearance as fibrin is familiar to us all in the coagulable portion of blood when withdrawn from a living animal. Such being the source and such the constitution of animal bodies, it is self-evident that an animal fed on food at once rich in heat and flesh-making elements, will rapidly increase in size. In practice this is found true only in degree, not per quantity; the absorbent glands can only take up so much within a certain time; whatsoever quantity is supplied in excess of this capability of elaboration is passed off in the excrement. The manure is all the richer, but that does not pay, inasmuch as ammonia can be purchased in the form of guano at a much cheaper rate than it is made by a waste of the nutriment of feeding material. Linseed cake, the best of all feeding material, is now £12 10s. per ton; guano is about the same: the manure made from the consumption of a ton of linseed cake contains about 125lbs. of ammonia, which, at 6d. per lb., is £3 2s. 6d.; guano contains 360lbs. ammonia per ton, which, at 6d., is £9, showing a difference in manure of £5 17s. 6d. in favour of guano, so far as ammonia is concerned. The consumption of cake for the manure being thus attended with such apparently ruinous results, one can scarcely bring one's mind to believe that there could be found in the midst of so much talk about chemical analysis, any man so utterly ignorant of what he was saying as to recommend by words, or sanction by his practice, the giving double or treble the quantity of this expensive article above that which could be appropriated by the animal. Such a one is a fit tenant for a lunatic asylum—any pretension to a man of business he cannot have. To discover the proper quantities of the carboniferous and nitrogenous elements which can be assimilated in a given time, becomes an object of much importance in stall-feeding; it is indeed all-important, and one of those subjects worthy the most attentive consideration of every Farmers' Club in the kingdom. Individual experience may do much to finally settle the question, but there required

to be passed in review the results of different quantities given at different times of the year to stock of different ages, under differing circumstances, all which few individuals have opportunity of doing. On referring to the relative quantities of constituents which are required to support organic life, we observe that swedes contain 14½ per cent. of the carbon, and 2 per cent. of the nitrogen; that peas contain 52 per cent. of the carbon, and 24 of the nitrogen. Taking 20 tons an acre as an average yield of good swedes, that will represent 6,500lbs. of carbonic elements, and 880 of the nitrogen; and taking 36 bushels as the produce of a like acre of peas, that acre will represent about one ton weight of produce in grain, and about 1,165 lbs. carbonic elements, and 538 of the nitrogen elements; the total quantity, including fractions, which an acre of swedes contain, is about 7,380 lbs. of both classes of nutriment—that of an acre of peas 1,703 lbs., showing a difference in favour of swedes of 5,677 lbs. It is thus perfectly clear that an acre of swedes will make much more beef or mutton than an acre of peas, but we must deduct something considerable from the relative value of the swedes on account of the water they contain cooling the system, and from its being necessary to give other food of a drier nature along with them to prevent looseness; still there remains enough of balance in their favour to render their economy in consumption a matter of primary importance in feeding. It has long been established that stock fed with a certain portion of cake along with swedes returns a greater amount of profit than when no other food than swedes is given. I have, in many instances, commenced with roots alone, but have almost invariably found that in order to make a good price per acre of the roots it is necessary to give them cake or corn. Corn used as an auxiliary in feeding is neither so healthy for stock, nor is its effects in the manure so great, as cake. Barley, for instance, containing only 13.3 per cent. of nitrogen compounds is not capable of making so much flesh as beans, which contain 26 per cent.; 125 lbs. being the quantity of ammonia made from the consumption of a ton of cake, which contains 20 per cent. of nitrogen, the source of ammonia. It follows that if the quantity of ammonia in the manure be in proportion to that in the article fed with, an equal weight of barley will give in the manure one-third less than that made from cake, whilst beans ought to give rather more than cake, and nearly double that of barley. Clover hay and oats will, according to this data, be greatly inferior to cake as regards the manure: oats would contain an equivalent to a little more than half that of cake, and hay a little less than half, and neither of them would produce so much fat as cake;—next to cake barley will make most fat, then peas, then oats, then beans, then clover hay. Peas and cake are nearest to each other; indeed there is little difference except that cake contains about 11 per cent. oil in addition to the other constituents, which is not present in any of the other articles. A prejudice prevails against giving barley to sheep. I have, however, used it extensively this season, and with very satisfactory results. I gave it in combination with cake—⅓ cake and ⅔ barley: with this mixture the sheep did very well, and when slaughtered weighed well and gave both butcher and consumer great satisfaction. I am a strong advocate for either a mixture of grain or changing frequently from one to another, but as peas at a 1d. per lb., and meat at 6d. are about equivalent as regards the prices of each, and as one year with another we can scarcely hope to realise more than 6d. per lb., I hold that we ought to mix cake and corn in such quantities as that they will together cost as near as possible 1d. per lb. When we can buy cake or peas at 1d. per lb., and sell meat at 6d., there is a method of management which will enable us to realise prime cost for the purchased food, and about 6s. per ton for roots, which is quite the feeding value of them. It will require nearly 200 lbs. of roots to make 1 lb. of meat, if we give no other food. On different occasions I have sown the land to wheat after swedes have been fed off with sheep, which consumed with them ½lb. cake each per day, and have never failed to remark that a gain in the next crop followed this method of feeding. I have never thrashed any separately, and therefore cannot speak to other measure than that discernible by the eye; but this I know, that on the same land where store sheep have consumed a part of the crop, the line of the different folds have been marked in the wheat crop too plain to be mistaken, and showing an apparent difference of eight bushels per acre. After the wheat has been removed, the land has been frequently sown with tares; the cake-fed portions bearing an equal quantity of food at least 14 days earlier. I reckon therefore the benefit to the farm by the consumption of ½lb. cake daily with a fat sheep equal to an indirect return of eight bushels of wheat per acre, and a supply of green food 14 days earlier than I could otherwise obtain it. But the effects of the cake is not confined to these crops: it will continue to have as much effect on the following corn crop after the tares; it is, in fact, a perennial improvement. In the first place, there is longer duration on the land by the sheep when feeding off the swedes: sheep will consume about one-tenth less food when they have ½lb. cake per day, while their own gain is much increased: not being in the habit of weighing them periodically, I can only speak from the result of that more convincing laboratory, the price realized in the market. And in the second place, there is the capability of maintaining a greater quantity of stock from the increased quantity of green food grown after the wheat, &c. The quantity of roots, which experience has led me to allow a bullock of 60 imperial stones, is not to exceed 150lbs. per day, and the maximum of cake for such a bullock is 5lbs. per day, with straw chaff *ad libitum;* whenever I have much exceeded these quantities, the net returns have diminished. Hay is an article I never use with fattening cattle, unless they are ill or in soiling, when it is a good thing in wet weather. With these quantities I have had no difficulty in making 6s. per ton for roots, prime cost for purchased food, and attendance with the manure, and a balance into the bargain. I have tried cooking in various ways—as for instance, on the plan recommended by Mr. Warnes, of Trimingham, and have on his method fattened some excellent animals when flax

seed can be purchased at 45s. per qr., and barley at 28s. A compound of ¼ flax seed, ground and boiled into a mucilage, and then mixed with ¾ barley meal, is cheaper than cake at £10 per ton. I have tried pouring the mucilage over cut straw chaff, and have added meal to suit the exigency, but I have not found that the cattle have made a greater return for their food than when the meal was made into a compound and the straw given uncooked. I have tried steaming in various ways. I have steamed chaff with meal, and without meal, and have mixed it with meal afterwards; but my experience in this line leads me to the conclusion that little or no benefit is gained by steaming the chaff. I have tried to reduce the quantity of roots to cattle by giving increased quantities of these prepared messes, but I have not found that the diminution of roots can be profitably brought below 3lbs. to every score lbs. of beef when the animal is fat—this is my minimum quantity. My experience in this way has strong confirmation by Col. M'Dowell, who published the result of a series of experiments made at Logan, in Scotland (Journal R.A.S., part I., vol 13). He thus sums up a somewhat elaborate report:—"With an annual experience in fattening upwards of 250 head of cattle in stalls and boxes, we have found that from 80 to 100lbs. of cut swedes per day, given in two feeds, morning and afternoon, and a cooked feed at noon, is quite sufficient to fatten cattle of from 40 to 50 imperial stones. As yet we have found nothing equal to two feeds of raw swedes and 4lbs. of bean-meal given as the mid-day feed. The further substitution of another cooked feed for a feed of swedes extinguished the profit by the increased expense of the dearer food." With the exception of cooking, my experience and Mr. M'Dowell's agree, and I have no doubt but that his cattle would have done equally well if all the chaff and meal had been mixed and given raw. It is something to know that cattle can really be fattened without hay, and that a certain amount of really good manure can be made on the farm by the use of purchased food, without diminishing the return made by the *cattle for the green crops*. Cattle in the stall should not be fed oftener than three times a-day; in a state of nature the ox will lie down 16 out of the 24 hours, and much more than that in a domesticated state, if he is full fed and left undisturbed. I once had an opportunity of testing this with a lot of cattle which belonged to a relative of mine, whom I went to see, and found him grumbling because his cattle did not get on. I asked him what he was feeding with, and whether they were free from disease. He replied that they were, and that they consumed enormous quantities of roots, which he was in the habit of serving them with six or seven times a-day. I desired him to discontinue his personal attendance, and give them up to some one who would feed regularly three times a-day. This was done, and in a short time the cattle improved when thus left to enjoy themselves after full meals much faster than when so often disturbed by the kind but ill-timed visits of the too-anxious owner. With the view of having my cattle fed only three times a-day, I have two mangers to each animal's stall, which allows the attendant to give the cake or other food at the same time that he does the roots, thereby leaving them at liberty to choose that which they like best at the moment; by this plan all unnecessary disturbance is prevented, and a clean manger is always insured for the purchased food. Of all methods of housing cattle I prefer the box system; it allows as much exercise as is required to promote health; it permits no waste in the manure, which is pressed down so evenly and regularly that little fermentation takes place, and consequently small loss is sustained by the escape of volatile gases; the liquid manure is completely absorbed among the solid, thereby saving the expense of tanks and all the cumbrous appendages of tanks, hose, water-carts, pipes, or hydrants, which are all required on the new system of liquefying all the manure. The expense of erecting boxes may, therefore, very well be paired off against all the outlay for this hydra-headed system. Box-feeding has a peculiar recommendation on sheep-breeding farms, which is that double the quantity of straw can be made into manure in the box than in the stall; it has been proved, too, that a much greater return for the food will be made by the cattle for the roots than by any other method of housing. Col. M'Dowall says 10 per cent. more than the stall, and 20 more than the open yard; but of course all these advantages must be given up when there is not enough litter: on such farms I would prefer the stall, for nothing retards fatting more, or renders it more disagreeable, than to have the cattle lie wet and uncomfortable; and besides, where there is not sufficient litter, the manure is so wasted by treading, that a much smaller space can be manured under such management than there can be with the same amount of straw used in the stall, and the manure removed every day to a mixen. One of the most important points of inquiry about fatting animals is, whether they should be fattened while yet growing, or not until the frame has arrived at full size; with the old unimproved breeds, the only method possible to fatten them properly, is to let them be full grown; but the tendency of our improved breeds of both cattle and sheep is so great towards early maturity, that growth and fatting can and does go on well together, with a good specimen of improvement. Green food equivalent to 25 tons of roots and one ton of cake, will afford nourishment sufficient to make a steer 40 score by the time he is 24 months old—this is exclusive of the weaning. 60 score is a good weight for a three-year-old ox; the grain in weight is therefore much greater for the food consumed during the two first years—it will require for the last year nearly as many roots, or their equivalent, as for the other two, and a much higher proportion of cake, viz., 1,825 lbs. The weight gained the third year would, in order to pay 6s. per ton for roots, and 1d. per lb. for cake, require to be 30 score, if beef was worth 10s. per score. This is at the rate of 11½ lbs. per week, and is considerably higher than the average gain for any length of time by even prize animals. I have fattened several at this age, and have found that the meat gives satisfaction, and that there is a fair amount of offal in the shape of rough fat. Such being the case, we ought to hear no more about the quantity of capital

required for stall-feeding; 40s. for a newly-weaned calf, £10 or £11 invested in purchased food during 24 months, is the whole affair in direct outlay, for which a quick return will be made, with interest into the bargain, to say nothing of the manure. Sheep will pay equally well as cattle when they are fattened young; indeed the practice is so common to fatten sheep under two years old, that old wether mutton is a thing to be talked of, but seldom seen. At one year old they can be sent profitably to market with a good quantity of edible mutton on their backs. All that is wanted to make a sheep ripe at one year old, is to take care that there is no standing still, and from the day that he is weaned till Michaelmas there should be given ½ of a lb. of cake daily, and after that time ½ a lb. per day, with cut roots and a little hay; ½ lb. per day is as much hay as will be consumed. Where this plan is followed steadily on land suited to sheep farming, it will be found that at twelve months old the sheep are heavy enough to pay 6s. per ton for the roots, prime cost for the cake, and a fair feeding price for the hay and attendance. In wet seasons they should have a temporary shed erected in one corner of the field, to lie in at night, or else be turned into some adjacent pasture: under no circumstances would I recommend housing sheep of this age—except under pecular circumstances, it is not a good plan for old sheep; but when they are housed they should be sold from the house. I have made some good mutton in a large yard, and have seen very good mutton made in stalls; still, as a system, I am not in favour of housing sheep, nor does the experience of others who have tried it encourage housing to a greater extent than a few weeks in the depth of winter with old sheep. On all farms adapted to sheep farming, in an average of years as much mutton can be made out of doors as in. The whole advantages of box-feeding can thus be obtained without the expense of carting in roots and out manure. The droppings pass directly into the land without trouble or waste. Why, then, should we attempt to forego so many advantages by confining an animal naturally adapted to an out-door life, the more especially as we have the ox, which cannot be kept out of doors in winter? Where farms are not adapted to carry sheep in winter, my opinion is that bullocks will pay better by providing temporary shelter; or by littering the fold with wheat straw every day, it is possible to fatten sheep out of doors in winter, under circumstances not at all favourable for them without these artificial helps—they are simple enough and cheap. In every calculation on the profits of fattening, it should be borne in mind that the annual sale of lean sheep deteriorates the land, whereas the sale of fat improves it. There are plenty of farms which 20 years ago never contributed a single pound of beef, which now export large quantities of this article, and there is no reason to anticipate other than increased supplies from thence; in short, whether we look to sheep as a means of increasing the profits of farming, or whether we regard them as animals especially adapted to increase the productive powers of the soil, we are irresistibly led to the conclusion that in order to make the greatest return at the least outlay, there are required sheep to be fattened out of doors, and bullocks in the house. Not the least advantage of sheep in the field is their feet, which compresses light and spongy lands, and saves mechanical labour to effect this necessary object. But for all these advantages, I am a decided enemy to the system of fattening sheep merely for the manure; I have long since come to the conclusion that ½ lb. of cake is as much as a wether sheep of 20 lbs. per qr. should receive daily. This quantity should not be exceeded when profit in the animal is looked for, and if a reserve were made of about 10 per cent. during fine weather, it would allow of an increase being made during continued rain or other ungenial weather, and thus prevent that loss in condition which too frequently happens when no extra allowance is made at such inclement seasons. This is the only alteration in quantity my experience leads me to recommend; it is the only gradation in the scale of allowances. I believe the common practice is to begin with a small quantity of purchased food at first, and to increase according to circumstances. When we put up a lean animal to fatten we know that the formation of fat is not to be expected until after the fleshy tissues have been developed to a certain extent; in order to effect this, it is requisite that the food should contain sufficient albuminous matter for their formation; roots and grass are comparatively deficient in these compounds, and as carbon will not be converted into flesh, there must be a large quantity of food consumed to supply the required albumen, as no disposition of fat is now taking place, it is evident that much carboniferous food is wasted. Were there given at this time just as much carboniferous food as would support the heat, and some bean meal, flesh would accumulate faster, and the consumption of other food would be economised. When the fleshy tissues are fully developed, the bean-meal may be withdrawn, and linseed-cake or pea and barley-meal substituted, whichever is cheapest; these latter will all make more fat and less flesh than beans, and are consequently better adapted for use in the latter stages of fattening; but whatever kind of purchased food is used, there should, as I have already said, be a uniform quantity given from the beginning. The habits of the animal show this to be the correct plan, for while they will consume when newly put up anything put before them with avidity, towards the end appetite fails; even the exertion of rising becomes too much, so little is the desire for food. This always appears to me to be the culminating point: so long as the regular allowance of food is consumed, the greater the amount of rest the greater the gain; but when keeping on is continued after the consumption of food has greatly diminished, there is a reabsorption of the fat, and a loss in weight and quality of the meat. Before this takes place, the animal should be slaughtered. This point will be reached at different degrees of fatness by different animals, and therefore it is the more difficult to deal with; it is one of those phenomena which requires the careful attention of a practised eye, and shows how necessary it is to attend to the daily condition of fatting animals. Hitherto I have spoken entirely of fatting on purchased food and artificially raised crops, but one cannot travel many miles without seeing much

grass land, often, unfortunately, of inferior quality, which does not make that return it is desirable it should. The greater portion of these inferior grass lands lie on the clay formation, and are cold, ungrateful, and, from deficiency of outfall, the primary means of effecting their improvement, viz., draining, is difficult of accomplishment; such land is generally rented comparatively high, and therefore requires a more careful attention to its management than it usually receives. The prevailing system of stock management on such land is generally the dairy system, than which none could be devised which would more completely defeat improvement; for while there is an annual deterioration taking place through the exportation of cheese and butter, the occupier finds that his capital invested in cows is difficult to keep together; the dairy cow, on poor land, is an animal which rapidly decreases in value after 7 years old: it is true that at 10 she may not be of less value as a milker, but let her miss calf, and her true value is felt. It will take a much larger quantity of food to make a stone of meat on such an animal at 10 than it would at 4 or 5 years old, and when it is made it is of much less value. Were a portion of these lands set a part for rearing young stock, either for dairy purposes or for fattening, many of the evils of the present system would be obviated. Much of this description of land will yield sufficient nourishment to bring young animals of good quality into good forward condition by the end of autumn, and where there is no danger to be apprehended from floods, the use of cake during the summer months would improve the land and stock economically: because our poorer pastures will not support a 60-score ox, that is no reason why a little coarse, ill-shaped, nondescript sort of thing should continue the unmolested inhabitant; this is a question which deserves the most attentive consideration of every proprietor and occupant of poor pastures. I happen to have the management of a grass farm on the London clay formation—the same formation, by the way, as we are now upon, and succeeded very well last year with a lot of heifers, which were put dry at Midsummer; they came to hand in the autumn in fresh condition, and were all sold fat by the end of January and beginning of February, with about the smallest quantity of cake of any beast I ever fattened. There is a system pursued in Berwickshire on purely arable and on mixed farms which merits attention;—the shorthorn there is the prevailing breed, and the calves are taken from the dam at one day old and fed on raw milk for a few weeks, during which they learn to eat cake, roots and hay; the milk is gradually diminished, but it is never skimmed, and at 13 weeks old is generally completely withdrawn; they are pastured on some convenient plot, often a corner of clover, till autumn, when they are taken into the yard and receive cut roots, straw, and a little cake; sometimes, but frequently not, the following summer they are turned out to some good pasture till September, when they are again put into yard and fed, and by the following May often fetch from £20 to £25 without having had any cake, but generally it is given in small quantity the second winter, especially by those breeders who have given it to them when calves. This is a paying system of management, and depends much more for success on the quality of the stock than on the land. Now this system might be made answer on other lands than the Berwickshire farmers have, were there the same attention paid to the quality of the breed; without good quality and regularity in attending to feeding and comfort, vain are all hopes of reaping any profit from fattening. We may meet here and logically discuss arguments without end on this and that system, but if we do not select animals which possess considerable aptitude to fatten, and feed them with scrupulous regularity, the issue will assuredly end in disappointment and loss; and after having done all this, after having complied with every requisite necessary to insure success, there yet remains a rock a-head on which the profits of many a well-managed lot of both cattle and sheep have been wrecked, and this is in the selling. Much as it is necessary to understand all, and much more than I have imperfectly endeavoured to shadow forth, it is especially required that we learn to understand the market value of our stock. It is notorious that many graziers are so ignorant of the actual value of fat animals that when they offer them for sale, they ask just as much as power of face permits, without regard to either weight or quality. The dealer, on the other hand, offers just as little, and calculates much more on his man than on the worth of the animals, and hence arise many a bargain which is sadly against the grazier: selling for what one can get, and selling at value, are two things often wide asunder, and in nine cases out of ten the dealer has the advantage with an ignorant seller. Were I a dealer or a butcher I would much rather do business with a man who really understood the value of his stock, and, while he demanded value, was yet willing to allow a fair working profit for removal to markets, &c., than with the other. Sheep may be weighed alive, and an estimate made of the weight of mutton; and cattle may be measured, and the weight of beef calculated with tolerable accuracy; but as fat sheep will vary from 11lbs. to 13lbs. of mutton to every score lbs. of live weight, and as the same rule applied to two animals may be scores from the weight of one and accurate in the other, there is much skill and judgment still left to be exercised. Still, these are helps which it is not well to overlook, and therefore I recommend weighing fat sheep and measuring cattle as a necessary part of a grazier's business. But my remarks have now extended farther than I intended. I have endeavoured to lay before you my ideas of the theory and practice of fatting cattle and sheep in as clear and concise a method as I am capable of. I have not come here as the exponent of a peculiar dogma, nor as an arbitrator between contending opinions would I have ventured before you, but I came here as an anxious enquirer after knowledge, and the question which I put is but another question put to nature, which will doubtless receive a clear and comprehensive answer from the experienced men to whom it is addressed. I am aware that my paper will stand no literary criticism, it was written for no such purpose; such as it is, it is before you; it is the embodiment of my own experience, "not a nosegay of culled flowers with little of my own, except the string to bind them."

Being only a plain blunt man, "I speak what I do know." The practical views which are enunciated throughout its pages dissect, criticise, and when you differ, hesitate not to condemn; but in considering its merits as an essay on fattening cattle and sheep, let me entreat you to deal gently with the writer for its subject's sake.

STEAM CULTURE.

"Specification of Chandos Wren Hoskyns: application of steam-power to cultivation of the soil, by means of rotary tilling machines—No. 1,899; A.D. 1853. Price 8½d."

Mr. C. W. Hoskyns, in his specification, says:

"This invention consists of a machine for the cultivation of the soil, more especially clay soils, by steam-power, applied in such manner as to accomplish at one process the due preparation of the soil for a seed-bed. This result is obtained by a machine which, instead of lifting in mass the stratum of earth under cultivation, like the plough or spade, is so applied to the soil as to reduce it by abrasion to the required tilth of fineness. This abrasion is performed by a series of discs or wheels fixed on a rotary axis actuated by steam-power, the periphery of which discs is furnished with radiating points or cutters. The rotating motion of the discs is communicated from the steam-engine, from which also the progressive motion of the machine is derived. The two motions are independent of each other, and so arranged that a rapid motion may be given to the cutters while the progressive motion is slow, or suspended altogether, as at commencing. The gearing is such that the respective speeds can be varied at pleasure, to suit the nature of the soil. The cutters by their rotary action first enter the soil, making a semicircular trench, which during the progress of the machine is constantly preserved at the required depth; and the soil, abraded and cut down as the machine advances, is thrown off tangentically behind, and deposited in a comminuted, inverted, and aërated condition."

Such is the cream, so to speak, of "The Chronicles of a Clay Farm," a work with which all our readers must be familiar. The machine for reducing to practice this abrasive theory we have never seen, but the drawings before us represent a ponderous affair, consisting of three distinct parts—the locomotive, the cultivating, and the steam-engine actuating both.

The locomotive part consists of four wheels, with the necessary connecting framing; the front two being leading or steering wheels, turning on the axle, and the hindermost two the driving wheels, fixed. The tires are broad, giving them more the character of rollers than wheels, in order to enable them to carry the incumbent weight; and those of the driving wheels have ribs or teeth projecting, in order to make them bite. The axle of the steering wheels turns upon a central-pin by means of racks and two side-pins, actuated by winch-handles, the racks and end-bearings of the axle working in curved guard-slides.

The reverse action of the driving wheels in turning on the headlands is not so well provided for; but, as there are obviously some typographical errors in the printed specification on this point, the probability is that justice is not done the invention. But granting the contrary, the oversight can easily be obviated by two central bearings and clutch-work joining a divided axle, so as to give each wheel separate and independent action at pleasure, on the principle of James's locomotive.

The cultivating part consists of a series of rings or discs fixed close together upon a shaft, each having a transverse arm with scraping apparatus or tillers on its extremes—one at each end; the whole together forming a sort of revolving clod-crusher. The tillers do not stretch in rows from the one side to the other right across, but spirally, so as to avoid a bumping impact in operating on the soil. And this position admits of their passing each other so as to make clean work. The shaft works in two boxes, one at each end, which slide up and down in the bearings of the frame, so as to regulate the depth of the cut, or lift the tillers entirely out of the soil, as at the headlands. This alternate motion of the axle-boxes up and down is effected by means of screw-work driven by a winch. Behind the tillers is a tail-board, in order, it is said, "to regulate the fall of the soil" and surface level.

The engine has two horizontal steam cylinders mounted on a bed-plate fixed in the side and central framing, immediately behind the driving-wheels, but above their level. These actuate the crank-shaft, which again communicates motion to the other two parts, as subsequently noticed; and the steam-boiler situated between the driving and steering-wheels is of ordinary construction, requiring no further description.

Motion is communicated to the tillers by means of two heavy endless chains working over chain-wheels on both ends of the crank-shaft and tiller-shaft; and speed may be regulated to suit different soils by means of different chains and wheels. To the driving-wheels, again, it is communicated by means of a worm or endless screw on the central part of the crank shaft, and a large bevil-wheel on the centre of the shaft of the driving-wheels, with a communicating shaft between the two, on the one end of which is a screw-wheel, into which works the endless screw; and on the other a bevil-pinion, which works in the large bevil-wheel. This large wheel is loose upon the shaft, and has clutch-work for throwing it out of gearing at pleasure.

Such is a very imperfect description of the different parts of this abrading cultivator. Drawings would have been necessary to have done it justice; but what we have said will enable our readers, perhaps, to appreciate its *modus operandi*. The whole is fixed together by strong framing, resting on the four wheels by means of bearings. Behind the driving wheels the framing bends downwards almost to the level of the ground; and in this part works the tilling apparatus, abrading or scraping the whole ground over which the wheels

pass to any depth required, throwing it backwards in a loose comminuted body—a fine tilth for seed. "Supposing the engine to make sixty strokes per minute, the gearing is arranged that the tiller shall revolve at about one hundred and twenty revolutions, while the driving-wheels only make one revolution in the same time. Supposing the driving-wheels to be one hundred and twenty inches in circumference, then an advance of one inch will be made at each revolution of the tiller; and the tiller having two tillers at opposite diameters, two cuts of half an inch will occur at each revolution, making in all two hundred and forty cuts per minute, equal to about two hundred yards per hour."

Such are the action and results of this rotary steam cultivator. Few of its kind have been ushered into the agricultural world with such an amount of rhetorical applause; but such is not exactly what farmers want at the present time. As much theory as possible, but give its complement of practice along with it. That the invention has considerable merit no one will deny; but that it has its shortcomings at the same time, we need not record at this period of its history; and that the latter overbalance the former is but too true. To make a long story short, the practical question deduceable from the whole resolves itself into this: Is the fine theory so graphically pourtrayed in "The Chronicles of a Clay Farm" to end in smoke? or is it possible to improve the machine before us, so as successfully to reduce it to practice?

The solution hinges on the soundness of the talpaian mode of culture; and here several very grave considerations demand the attention of the practical man. In the first place, for example, we have the fact that if clay land is wet, as during the winter months, the rotary tillers actuated at such a velocity as the progressive motion demands would work it into mortar, their action being exactly analogous to that of a bricklayer's labourer working mortar (?). In the second place, if the work is postponed until the soil is sufficiently dry for abrasion, will there not be a risk of losing the *sap* in scorching seasons, and thus fail in getting a regular braird? And in the third place, again, if a heavy shower falls immediately after the land is abraded, will it not consolidate into a solid body, more unfavourable to aëration and vegetation than ever? We know from experience that this is the case with mole-hills in clay lands, and also when such lands are reduced to too fine a tilth; hence the question, will rotary abrasion be found an exception? Those who have any experience in farming heavy clay soils must be familiar with the difficulty of getting, at times, a few inches on the surface sufficiently dry to admit of abrasion with the harrows; and, in autumn, of being obliged to plough the land in a state of wetness, and harrow in wheat, when abrasion would be absolutely impossible. In the fourth place, mechanical comminution by abrasion, and disintegration by frost, are two very different things; the former consolidating by drought after heavy rain, and the latter not. With the one, mangolds and swedes can be grown on very heavy clays; but with the other, success is hardly possible; for, even granting that stubble lands could be abraded in November and December, so as to benefit by the action of frost, the machine cannot loosen and abrade the subsoil between the "wet and the dry" in spring, leaving the fine frost-made tilth on the surface for a seed bed. In the fifth place, rotary action cannot cover-in manure, the sward of grass lands, stubble, &c.; but, on the contrary, would leave everything of this kind on the surface—the worst farming possible. In the sixth place, from the progressive motion being continuous, the curve described by the tillers is consequently cycloidal, so that the question of a level bottom or uniform depth becomes very problematical, unless at a very high velocity of the tiller or slow motion of the driving-wheel. In other words, either the velocity must be objectionable, or the machine must go at a snail-pace, and hence prove an expensive concern. In the seventh place, the machine can do nothing but abrade—according to the principle on which it is at present constructed—granting that with Boydell's "endless railway" it could propel itself over unploughed land. And, in the eighth and last place, rotary action with continuous progression is a mistake, as we shall prove, under Usher's proposition.

On the other hand, when clay lands become too dry and hard for ploughing, as they frequently do, they could no doubt be abraded with intermittent action, and any vegetable matter thrown to the surface covered in by the plough afterwards. In other cases, again, when lands for barley, potatoes, or mangold are by any means allowed to bake into clods as hard as bricks, once over the ground with the tiller would be far more effective than several ploughings and clodcrushings.

The improvement of the machine therefore so as to effect this becomes a practical question. That the endless railway would enable it to propel itself forward over land in either of the above conditions cannot be doubted after the successful experiments at Woolwich and other places belonging to Government, before an engineering staff—the best qualified perhaps of any in the kingdom to pronounce an award on the merits of Boydell's invention. But this is not enough; for the tilling apparatus must be made so as to be detached at pleasure, and ploughing apparatus applied; or the engine may be stationary along the headlands, as already noticed, or fixed at the homestead, and the tiller made to revolve in a separate frame on wheels, according to the propositions of Williams, Fisken, and others, whose merits will in due time be reviewed.

Into the details of such alterations it is not our part to enter at present, suffice it to say they can easily be done. Many combinations of this kind will be effected before steam culture can be generally adopted. At present a common error appears to be to confine the mind to isolated propositions, forgetting the diversity of demand which soil and circumstance make. Different soils, for example, and inclinations, will require different mechanical appliances, scarcely two farms in a district being alike. One farmer can buy another's horse, plough, or thrashing-machine; but it may be otherwise with steam cultivators. Time will tell. When we

come to glance at combinations to meet peculiar circumstances, it will be seen that what appears the most promising proposition to one farmer is the reverse to another; and that each will have to judge for himself, avoiding dictation to his neighbour. That we are approaching rapidly towards successful steam culture cannot be doubted; and that Hoskyns's "rotory tilling machine," although at present on the shelf, may form a link in the chain of progress, is not unlikely.

It is to be hoped that our readers will not misunderstand these and previous observations on steam culture. We are not advocating, it will be seen, any exclusive system, much less writing up or down the merits of individual inventions. With something like a dozen before us, each of them possessing some valuable part required to make a successful whole, it would be highly injudicious to do so, and even unjust towards inventors themselves. After we have glanced at inventions still under patent, where the rights of patentees must be honourably respected, we shall then be able to enter more successfully on the cultivation of different soils, refuting the many objections brought against steam culture, whether on the locomotive or fixed-engine principle, with rotary-rectilinear or reciprocating action. We have said above, for example, that Hoskyns's tiller would break clods; but a query may here be raised, How can a locomotive travel among our summer-fallow clods? To prejudices of this kind we shall show that the practice of spring ploughing cloddy fallows of Oxford and Weald clays is getting out of date, even with horse traction, and will be tenfold more so with steam, and where exceptions occur, steam culture admits "the cart before the horse" to obviate the difficulties involved; such is the revolution it involves. What we wish to draw particular attention to, in our present article, is a certain class of soils—Oxford clays, &c.—which cannot be ploughed, often, for months after harvest, but which may be abraded with intermittent action without destroying the drainage of such soils, as is now experienced, by the feet of horses and action of the plough after rains set in. Bean and pea stubble could thus be tilled, and wheat dibbled in afterwards by the hand, should heavy rains fall to prevent a locomotive entering the ground with a drill, or the latter being drawn over it, as proposed by Williams, Fisken, and others. Here, however, we may again be permitted to observe that, from the more perfect system of drainage involved, a locomotive and drill, both being furnished with endless railways, can enter clay lands with less harm than four horses, as at present. We repeat, *for the benefit of our drill makers*, that we were always obliged to yoke four horses in a heavy drill in drilling in guano and seed, both in autumn and spring, among the cold clays of Huntingdon, doing an amount of harm not very easily estimated; but with the endless railway three horses at Woolwich did what twelve were unable to do without it on soft marsh land. Hence the conclusion, *one horse instead of four*. Let clay farmers and drill makers think of this for a little. In other words, small engines on large farms for light work of this kind, and contract work on small. Whoever dreamt of a 6½-ton engine to do the traction work of one horse?

WHY HAVE WE NOT AGRICULTURAL COLLEGES IN ENGLAND?

Dear Sir,—In my fourth paper on the "Characteristics of Wheat," I made a slight reference to the above subject, in the hope that some of your influential and intelligent friends would take it up. Finding, however, that such is not the case, and that the question is allowed to fall to the ground, I feel induced to resume my observations upon it, in order to explain more fully the advantages that would accrue to the agricultural interest from such institutions.

There is no question now of the connection of agriculture with physical science, and that almost, if not quite, all the operations of that art are based upon scientific principles, whether the practitioner be aware of it or not. In the implements he uses, the power applied to them, the work he performs with them; in the selection, preparation, and application of his manures; in the selection of his seed corn; in the treatment of his cattle, and mode of feeding them, with a thousand other things which it would tire your readers to enumerate, science is the foundation upon which they all rest. And it is through the knowledge of the principles by which they are governed that we are to ascribe those extraordinary results which of late have been produced by scientific farming. It is, I say, to the knowledge diffused by a Liebig, a Kane, a Davy, and other men of mark—who have dived into the secrets of nature, and turned them, in a manner, inside out—that agriculture has attained that eminence we now witness. It may be fairly questioned whether there be any branch of science which is not, in one way or other, beneficially applicable to agriculture.

This question is much better understood than formerly, even by the less enlightened farmers—those of the old school, if there are any such left. They begin to see that those of their neighbours who have paid the most attention to it produce the best heads of cattle, and the heaviest crops of corn, hay, and roots. I therefore have a right to presume that the mind of the agricultural public is prepared for taking a decided step in this matter, by being convinced of its importance, and that they only require some leading man in their own community to set them going. With this conviction, I shall endeavour to point out some of those desiderata which a course of agricultural academic education should embrace.

I take it for granted that the pupil who would enter the college will be previously well versed in the usual branches of a common English education, with a know-

ledge of the rudiments of the mathematics and mensuration, both of which will be essential to the practical application of most of the other sciences. The academical course of a student, in the proposed college, ought to embrace geology, mechanics, hydraulics, pneumatics, botany, veterinary medicine and surgery, and, above all, chemistry, which should constitute the alpha and omega of the student's acquirements. The practical use of the steam engine should be combined with a knowledge of all its parts, so as to be able to superintend its use upon a farm, if necessary. Certainly the time is fast approaching when the steam of the boiler will supersede the sweat of the horse or man; when the labour of a farm will be performed by mechanical, instead of human or brute power; and when the efforts of these latter, relieved from the severest and most onerous of their toil, will be profitably employed under scientific direction, in imparting, in various ways, additional fertility to the lands now cultivated, and in subduing the sterility of those hitherto considered unprofitable.

But let us look a little more closely into these proposed scientific acquisitions of a young farmer, and see how they bear upon his future profession. For this purpose I shall take them *seriatim*, as I have casually set them down; and to begin with geology, or the doctrine of the earth, and an acquaintance with its stratical structure. This surely cannot be considered a useless study to the farmer, whose whole business relates to, and whose whole profit is derived from, the earth. To know the nature of the soils of a farm, both above and beneath—to be acquainted with their names, properties, and compositions, is, in connection with chemistry, to become acquainted with the most beneficial mode of using or treating them. I shall give one instance in proof of the utility of such knowledge.

In the great limestone plain of Ireland, extending over some of the most fertile portions of that fertile country, the produce of wheat has fallen off since the famine (1846) from twenty barrels (400 stones) per acre to from four to eight barrels. Various causes were assigned for this enormous deficiency. It was ascribed to the loss of the potato, the wearing out of the soil, &c., and even to more occult and moral causes, which it is needless to repeat. Upon a chemical analysis, however, of the surface soil at different points of this plain, by Sir Robert Kane, Professor Davy, and other scientific men, it was found that notwithstanding the abundance of limestone in the sub-strata, not a particle of lime could be detected in the upper soil; consequently, the discontinuance of the use of lime, which took place after the famine, deprived the land of those substances without which wheat cannot be profitably cultivated.

A knowledge of mechanics embraces that of the principles on which all the operations of a farm are conducted; and I have no hesitation in saying that, if such knowledge were generally diffused amongst the agriculturists, one-third of the labour of the farm might be saved in many districts of this country, and a much larger produce obtained. This branch of science is closely allied with the two following—namely, pneumatics, or the doctrine of the air; and hydraulics, or the science of the conveyance of water—this latter so essential in the irrigation of land, as well as in draining it. What do we not owe to the machinists of the present day for the vast improvements derived from the mechanical science they have brought to bear upon the subject of the construction of machinery of every description used in husbandry? What fortunes and what mental efforts have been spent in the process between the first conception of an instrument—say the reaping machine, for instance—and its arrival at perfection! And yet, when the incipient idea is started, the projector is either too often ridiculed as a visionary, or condemned as a schemer; or, more frequently, some other person improves upon his plan, remedies his defects, and ultimately robs him of the fruit of his talents and the profit of his outlay.

The advantage of a knowledge of hydraulics I need not descant upon. The scientific application of water upon, or its abstraction (in excess) by draining from, the land is too palpable to require enforcing. Perhaps more labour and expense has been bestowed upon draining and irrigation the last twenty years than for a century previous; and we anticipate the time when all the bogs and marshes of this country will be freed from surface water, by the passing of an act for general arterial draining. The rivers of England, in fact, form the principal obstruction to the universal relief of the land from those physical blemishes which meet us in different parts of the kingdom in the shape of shaking bogs and flooded marshes. When this desideratum—arterial drainage—is carried into effect by a legislative enactment, as in Ireland, the local drainage of the land will be an easy task.

The science of pneumatics includes, or is closely allied to, meteorology; and both are essentially necessary in the proper education of an agriculturist. The thermometer and barometer are to be found in most farmhouses, but a scientific acquaintance with their use is not generally possessed; and although experience and observation of the various atmospheric phenomena have given the farmer—ignorant otherwise of science—a portion of knowledge useful to him in the various operations of husbandry, it will surely be advantageous to him to become acquainted with the principles upon which those phenomena proceed or are founded. It is true the science of meteorology is far from having arrived at any degree of perfection, and, indeed, may yet be considered to be in its infancy; yet much light has been thrown upon it by late investigators, and many of the phenomena have been more clearly defined, classed, and explained, so as to bring out their characteristics and uses in the economy of nature, and thus render a more intimate acquaintance with them subservient to the benefit of man; especially the agriculturist, who depends so much upon atmospheric agency in the prosecution of his farming operations.

Is it needful for me to point out the benefits to a farmer of a knowledge of botany—that science which embraces the history of the most beautiful and useful of the physical creation? Would it be of no use to a

farmer to know the nature, habits, uses, mode of growth, and propagation to the best advantage, of the plants from which he is to derive his profit, or the characteristics of those which he considers it necessary to destroy? In the arrangements of the proposed College I should include a botanical garden of the first order, as an essential adjunct, with a professor attached, and that the students be thoroughly grounded in the principles of this science.

A knowledge of the veterinary art, and surgery, with an insight into comparative anatomy, would be a *sine qua non* in our institutions. How many valuable horses and cattle of every description are annually lost, through the ignorance of the farmers even of the common operation of bleeding, and the distance they have to send for a veterinary surgeon! Surely a general knowledge of pathology, or of the symptons, causes, and cure of the diseases of cattle, is an acquisition of the first importance to one who has hundreds of lives and pounds sterling at stake, and who perhaps lives far from medical aid when required.

Our last article is chemistry; and as I have on former occasions endeavoured to urge the study of this branch of science upon the agriculturists, I shall not now enlarge upon it, further than to say that it is impossible to be a *good* farmer—by which I mean one who makes the most of his land—without some knowledge of it. The whole profit of a farmer, in fact, depends upon those chemical operations which Nature herself conducts, and who demands of us only an intelligent use of those means she has put into our hands to assist those operations. But we cannot make an *intelligent* use of those means unless we are acquainted with the laws upon which the operations of Nature are conducted, so far as relates to the sustentation of her productions; and those laws can only be ascertained by chemical investigation.

I have thus briefly re-opened this interesting subject, which I consider to be of vital importance to the interests of the country, if these are at all connected with the elevation of one of its most important sources of wealth from a condition of general ignorance and prejudice, as an employment, to the dignity of a scientific and an enlightened profession. Hitherto science has pursued an *up-stream course*, commencing at consumption and labouring her passage through commerce and manufacture with steady progress, until, arriving at perfection, she has met with a barrier of stolid indifference and self-conceited prejudice, to surmount which has required the efforts for half-a-century of the most enlightened and scientific men of the age. Their unwearied perseverance has at length been crowned with signal success, and agriculture is now placed by them upon a pedestal worthy of the position originally assigned to it by the will of Providence and the laws of Nature.

The impetus having been thus given, and the momentum, I hope, attained, it remains but for those who possess the power and the will to send it forward, and raise agriculture to a science in reality, by the establishment of those educational institutions, by which the next generation of farmers may be initiated into the mysteries of Nature relating to the earth and its productions. I am glad to find that a commencement has been made already, by the establishment of a private college of agriculture by Messrs. Nisbet, at Kennington, where a number of youths are now receiving instruction in practical science, to fit them for the profession of farming on the principles I have advocated. The admirable lectures to the students by Professor Johnson, and which were inserted *in extenso*, I presume, in your paper, cannot fail to place this institution, experimental as it is, in a favourable point of light with the agricultural interest; and it is my sincere hope and wish that this first effort of the kind may be crowned with the most signal success.

Yours truly,

AN OLD NORFOLK FARMER.

London, 4th Oct., 1855.

IRISH AGRICULTURAL STATISTICS.

CROPS GROWN IN 1854 AND 1855.

CEREAL CROPS.

	1854. Acres.	1855. Acres.	Increase. Acres.	Decrease. Acres.
Wheat	411,284	445,509	34,225	—
Oats	2,045,298	2,117,955	72,657	—
Barley, Bere, Rye, &c.	287,154	267,565	—	19,589
Total	2,743,736	2,831,029	106,882	19,589
Deduct Decrease			19,589	
Increase on Cereal Crops			87,293	Acres.

GREEN CROPS.

	1854. Acres.	1855. Acres.	Increase. Acres.	Decrease. Acres.
Potatoes	989,660	981,529	—	8,131
Turnips	329,170	366,497	37,327	—
Other Green Crops*	98,777	95,094	—	3,683
Total	1,417,607	1,443,120	37,327	11,814
Deduct Decrease			11,814	
Increase on Green Crops			25,513	Acres.

* Mangel wurzel, beetroot, carrots, parsnips, cabbage, vetches, and rape, are included under this head.

GENERAL SUMMARY, INCLUDING MEADOW AND CLOVER.

	Acres.
Increase on Cereal Crops	87,293
Ditto on Green Crops	25,513
Ditto on Meadow and Clover	53,873
	166,679
Deduct Decrease on Flax	54,297
Total Increase in the extent of Land under Crops	112,382

Total extent in Statute Acres of CEREAL and GREEN CROPS grown in Ireland in 1852, 1853, 1854, and 1855:—

	1852. Acres.	1853. Acres.	1854. Acres.	1855. Acres.
Wheat	353,566	326,896	411,284	445,509
Oats	2,283,449	2,157,849	2,045,298	2,117,955
Barley, Rye, &c.	339,591	348,642	287,154	267,565
Potatoes	876,532	898,733	989,660	981,529
Turnips	356,790	399,377	329,170	366,497
Other Green Crops	121,565	120,133	98,777	95,094
Flax	137,008	174,579	151,403	97,106
Meadow, &c.	1,270,713	1,270,742	1,257,864	1,311,737

THE EARL OF LEICESTER ON THE LABOURING CLASSES.

At the Docking Agricultural Association, the Earl of LEICESTER said: I am called upon to take the chair at meetings many times in the course of the year, but on no occasion do I feel that I am doing my duty more than I do on these occasions, when I come to assist in promoting the welfare and the happiness of our labouring population. I think also, gentlemen, that I owe a debt of gratitude to those who manage this society for the very admirable manner in which it is conducted. I must also take this opportunity of stating my approval of the manner in which the whole of the business connected with the poor in this Docking Union is conducted. The way in which the poor are looked after here, and the manner in which the rates are expended—with economy combined with liberality—gives confidence to the ratepayers, and is a credit to the county generally. We are met together, gentlemen, for the purpose of rewarding and encouraging the agricultural labourer. This association can do a great deal; but a great deal rests with the owner of the cottage in which the labourer resides, and next with the occupier of the land on which he is employed. First as to the owner of the cottage. I have the misfortune—at least the misfortune as far as I am concerned—to be a very considerable owner of cottage property. I have endeavoured, as far as I can, to improve the cottage of the labourer, and in doing so I trust I have both physically and morally improved his condition. In the first place I have endeavoured in building my cottages to provide such accommodation as will allow a human being to live in the way in which a man should live. In the next place, I have endeavoured to build those cottages at as little possible loss to myself as I can. To expect a profit from cottage property without screwing the tenant is impossible. By not allowing lodgers to be taken in, by enforcing a few other simple rules which it is necessary to make with the labouring classes, and by having my tenants in nearly every case directly under me as their landlord, I firmly believe that I have improved their condition both physically and morally. Now, gentlemen, as to the master who employs the labourer. When I, as an owner of cottage property, have done as much as I possibly can to improve the condition of the labourer, much still rests with the master who employs him. I believe, gentlemen, a good master makes a good man. I believe if a little more attention is paid in looking after the labourers we employ, we may make them, in many cases, much more efficient, and give them a much greater interest in the soil on which they work and the prosperity of the master who employs them. I believe that when we take labourers from another farm, by making a few inquiries into their characters at the place which they have left, by paying the same kind attention to them that we pay to our domestic servants, by taking, in short, an interest in them which we have not hitherto displayed, we might induce among labourers a regard for character which at present does not exist sufficiently in our district. You have, no doubt, seen the letters which have appeared in the *Times* in reference to Norfolk labourers. As far as my experience goes—and I have been a great employer of labour, and am well acquainted with the habits and feelings of the labouring classes—I believe no county in England will produce a labourer who will do so much work for the money paid him. At the same time there are vices in the Norfolk labourer which it should be in our power to eradicate. I say eradicate, and I will take this opportunity of alluding to what my friend on my left (the Hon. and Rev. T. R. Keppel, brother of the Earl of Albemarle) has said with respect to the giving of largess. I believe that the giving of largess has a most injurious effect upon our labourers; in many cases I think it is the first introduction to the beershop. In saying this, I don't wish for a moment to lessen the number of holidays and indulgences which our labouring classes possess, for they are few enough now, and I should be rather inclined to increase than to diminish them. It may be said that this custom of largess is an old custom; but if the custom, though old, is a bad one, there is no reason why we should not abandon it. Our forefathers lived on acorns and mast; but that is no reason why we should return to that food. If an old custom is a bad one, let us get rid of it. I believe that the plan carried out at Banham by Lord Albemarle and the clergy and gentry of that district would prove of inestimable benefit to the county if it were adopted throughout Norfolk. One of the great evils we have to contend against is the vice of drunkenness. As an employer, I find I can deal with men, let their vices be what they will, if they are not given to drunkenness. With the drunkard I can do nothing. On the Friday, when he is paid, he goes to his beershop, and he won't appear again till Tuesday, and then he will come back in such a state that it is useless to employ him. I think, if the society has already done so much good with the assistance of Mr. Blyth and others, it might endeavour to put down a crying evil like that of drunkenness. I firmly believe that if we set our shoulders to the wheel much might be done; and, as far as I am concerned, I am ready to give you assistance both in time and money. It has been the custom at Holkham to give a large sum every year as a largess; it has all gone in drink, and I am ready to give that sum, and double that sum, to assist any persons who are willing to use their energies to put a stop to that which I believe is a very great evil in this county. Living, as I do, very much in the country, and connected as I am very much with the labouring classes, I am apt to get led away when I speak upon this subject. With respect to the question of education, which has been started this evening, I think that the plan of establishing a library for the poor would be productive of very considerable benefit. At any rate, gentlemen, I am satisfied that we should get an excellent library ourselves; and I think if a certain portion of the artisans, tradesmen, bricklayers, and labourers in a parish could be induced to read, their example would induce others to learn to read also. The great difficulty we have to contend with is this; it is all very well to talk about schools and education, but we hold out such inducements to boys six or seven years old, that in a large family it would be very unnatural if fathers kept their sons at school when they can earn 3s. or 4s. a-week. Boys in this district of Norfolk can get certain employment when they are seven or eight years old; they are removed from school at about that age, and I think the most desirable plan would be to endeavour, if possible, to teach those boys in adult schools when they are old enough to see for themselves that it is desirable to learn. The library proposed to be established here may have this effect—it may induce young men, instead of spending their time at publichouses and beershops, to learn to read, and to endeavour to put themselves in the same position as those who have already been educated.

THE FUTURE OF AUSTRALIA AND HER AGRICULTURAL POPULATION.

For a year or two past, Australia, to the general eye of the British population, has appeared chiefly in the light of a distant country, to which thousands have flocked annually to engage in a sort of romantic struggle, which was to result in the possession of large masses of native gold. The popular dream has been of nuggets—the waking conversation has turned mainly on the success of the "diggers," and the arrivals of gold. These golden dreams, however animating, that eloquence, however exciting, which connects Australia only with the wealth of its gold fields, is not the most natural any more than it has been the longest familiar to our ears. The true value of that noble colonial possession consists much more in fertile vales and verdant plains—in its salubrious climate and teeming uplands, than in even the boundless wealth of its seemingly exhaustless gold fields. Its capabilities for producing cereal wealth in rich abundance, and for propagating and maintaining vast flocks of sheep, and noble herds of cattle and horses, will be found a more reliable source of immediate happiness and future greatness than is to be found in the tempting, though frequently delusive labours of the "gold diggers," important and beneficial although these have beyond question proved.

Such an opinion seems fortunately to have at last found favour in the eyes of our home government, and to form now a leading feature in the policy pursued by the authorities in the colony. At a meeting of the Legislative Assembly, held in Melbourne, in March last, the Surveyor-General intimated the intention of the colonial executive to dispose of a million of acres of land in the neighbourhood of Geelong, and within less than twenty miles of the Ballarat and Alexandria "diggings," at the rate of £1 per acre in fee simple. This, he stated, must be done with a view to encourage agriculture. The district in question is well known for the promising fertility of its soil, being generally fine alluvial land, lightly timbered, and admirably adapted for the production of grain crops—capable, it is said on good authority, of yielding from seventy to a hundred bushels of grain per acre, without manuring.

Some idea of the prospects of agricultural industry in the district referred to (Victoria) may be formed from the following brief statement. The ships which in 1788 landed the first (convict) settlers, landed also one bull, one bull-calf, four cows, one stallion, three foals, and three mares; and from these have originated the vast herds of cattle and horses which now constitute so large a portion of the native wealth of the colony. The climate is salubrious in a high degree. "The heat," says a competent authority, writing in the *London Quarterly Review*, for December, 1853, "brings no fevers, the rains no ague, the colds no consumption, the rivers are not bordered by miasma, the plains are bracing, the air pure, the sky open, blue, and bright; the bush itself is free from forest poison; the settler can range over the land by day or night, and carry his family over downs, hills, prairies, and bush, sleeping in waggons, or on the sward, without any fear of malaria to blight the healthy, or insidious fogs to undermine the delicate." As a sheep-rearing country some estimate may be formed of its adaptation from the fact that, in 1838, the sheep contained in the settlement of Victoria did not amount to 200,000; in 1851, they numbered upwards of 5,000,000; in addition to which the colony could boast of 390,000 head of cattle and 16,500 horses. While in the same year the shipments of wool from the new colony of Victoria amounted to twelve millions of pounds weight. With such means of fertility open to him, what room is there to doubt the success of the industrious agricultural emigrant?

A Scotch gentleman of ancient lineage and no fortune afforded a striking instance of what may be done in a colony by industrious hard work, with the help of a large family, without that capital which, according to theorists, it is indispensable that a landowner should possess. He arrived in the colony very early, the owner of a single eighty-acre section, with twelve children, one-half of whom were stout-made grown lads and lasses; his whole property consisted of a little furniture, a few Highland implements, a gun or two, a very little ready money, and several barrels of oatmeal and biscuit. His section had been selected for him previous to his arrival. It lay on the other side of a steep range of hills, over which no road has been made, ten miles from the town. He lost no time and spent no money in refreshing or relaxing in Adelaide; he found out a fellow-countryman, who lent him a team of oxen, dragged his goods over the hills to his land, and encamped the first night on the ground under a few blankets and canvas spread on the bush. The next day, and from day to day, the family worked at cutting trees; there was timber plenty for building a house. This house, situated on the slope of a hill, consisted of one long low wooden room, surrounded by a dry ditch to drain off the rain, and divided into partitions by blankets. The river lay below, any water needed was fetched in a bucket by one of the young ladies. A garden, in which all manner of vegetables, including tobacco and water melons, soon grew, was laid almost as soon as the house. An early investment was made in poultry; the poultry required no other food than the grasshoppers and grass-seeds on the waste land round. Until the poultry gave a crop of eggs and chickens, the guns of the lads supplied plenty of quail, ducks, and parrots. In due time a crop of maize, of wheat, and of oats was got in. Before the barrels of oatmeal were exhausted, eggs, chickens, potatoes, kail, and maize afforded ample sustenance, and something to send to market. Labour cost nothing, fuel nothing, rent nothing, keeping up appearances nothing; no one dressed on week-days in broadcloth, except the head of the house. First, a few goats, and then a cow, eventually a fair herd of stock were accumulated. Butter and vegetables found their way to Adelaide; and while the kid-glove-gentry were ruining themselves, the bare-legged boys of the highland gentleman were independent, if not rich. The daughters, who were pretty, proud, and useful, have married well. In another generation, families like this will be among the wealthiest in the colony.

The foregoing is indeed an illustration of history teaching by example. Every emigrant, it is true, may not have to boast of a dozen healthy and useful children to share his industry and forward his operations; but a similar amount of prudent forethought, and the exercise of kindred sagacity, in regulating his undertakings and directing his pursuits, will be attended with similar results, modified only in degree corresponding with the modification of the circumstances under which he has entered upon the duties and responsibilities of his new position.

AUTUMN TILLAGE.

No sooner are corn crops secured in the stackyard than the harvesting of root crops for the getting-in of wheat commences on all farms where this our principal bread-corn is grown. We may talk of autumn fallowing, cleaning of stubbles, draining, and subsoiling, to facilitate the work of the ensuing spring and summer; but however much can be done in this way, the more important work of harvest and autumn-sowing of wheat must never be neglected. If the season is early, in the southern counties turnips may be profitably sown, and many kinds of improvements advanced a stage; but farther north, and in late seasons in the south, this cannot be done; and the successful practical man never sacrifices his autumn wheat, the present during every period of the year being always embraced by him, and certainty preferred to speculation.

Some farmers, with respect be it said, wage an eternal warfare against weeds in autumn, as in spring and summer, ever acting upon the offensive — an allied host of docks, thistles, couch-grass, coltsfoot, &c., &c., being in the field against them; but the plan is a mistake, the more judicious course being the defensive. This is susceptible of very easy proof, for in the former case the weeds have always the advantage, whereas in the latter the odds are in favour of the farmer. The golden rule therefore is—not to grow weeds, and thus avoid hostilities with them. Consequently, in getting-in winter crops of every kind, a sharp outlook is necessary, to prevent their being sown with the seed, or transplanted from the last year's growth, if previously in the soil. The neglect of this is always productive of ruinous results; for the seeds of weeds sown at this season, or roots transplanted, establish themselves early in the spring, taking the first advantage of unfavourable weather, and every other opportunity, to supplant winter crops, robbing the soil of what ought to have nourished them, as well as food which they have rejected. This is also true of spring crops; only, their period of life being shorter, weeds have less opportunity of establishing themselves.

A common error is to place too much confidence in the perfect cleaning of land for green crops, and too little in that for the cereals which follow. In other words, the farmer, aware of the ruinous consequences of dirty land, fights a pitched battle with weeds at the end of every rotation of cropping, triumphing over them as a matter of course, but concluding an armistice of peace with those who survive at the commencement! thus experiencing every year an autumn, spring, and summer campaign during the currency of his lease.

Now, the reverse of this is obviously the sound practice at issue, viz., to exterminate every weed which survives the green crop fallow, in laying down the first cereal crop of every rotation. If we farm on the Norfolk or four-course shift, for instance, then it is usual to commence with a green crop: thus, 1st, turnips, potatoes, &c.; 2nd, wheat and barley; 3rd, seeds; and 4th, oats and wheat. The first is termed a "cleaning crop;" and the other three, weed-producing crops. But this mode of expression, being erroneous, is calculated to lead the mind astray; for the cleaning quality of the first has reference to the mode of culture, and not to the crop itself, which is perhaps the most weed-producing of any in the rotation. The facts of the case are these—weeds not removed during the first, are propagated during the second, third, and fourth. Whereas, were they removed, the fertility of the soil kept up, and no fresh supply of weeds sown, the subsequent crops would be clean, and the epithet of "cleaning" no longer applicable to the first crop of the rotation.

The fallacy of our present practice then is patent, and may be thus further illustrated: for example, the difference between the offensive and defensive systems lies in dating the commencement of the rotation from the land in its maximum state of weeds, and in the manuring of the green crop only, giving it the cream of the manure, so to speak, of the other three crops; whereas the rotation ought to commence with the land in a perfectly clean state, and, in point of fact, does so, the farmer never ridging it up for turnips until he thinks it in this state; while each of the four crops should be manured, the lands having previously been cleaned, the fourth as well as the first, and the third as the second; thus keeping up the whole farm to an uniform degree of fertility and cleanliness, annually procuring from each field the greatest amount of produce it is capable of yielding. Under the former, we are wrong both in weeding and manuring; and when we examine the physiology of weeds and our cultivated plants, it were difficult to say whether our mode of weeding or manuring has the greatest tendency to multiply weeds. Under the latter, on the other hand, the manurial wants of the respective cultivated crops are annually supplied as required, while those of weeds are neglected. The autumn and spring cleaning of the fourth crop is not exclusively due to it, but to the previous two also; whereas we erroneously debit the first with the whole expense, while the entire amount of labour thus entailed upon it compels us to hurry the work over less perfectly performed, and to neglect weeding prior to sowing the second crop, at the same time. The fact ought never to be overlooked, that almost all the labour thus expended in weeding is extra work, and when deferred until spring, is more than can be executed in time for getting in green crops, especially potatoes, mangold wurzel, and swedes, so as to ensure a good crop; while the cleaning of lands for barley and other cerealia, about to be sown down with seeds, is neglected. If undertaken in autumn, again, the work interferes with the cleaning of lands for wheat, which on no account ought to be neglected.

The getting-in of the second crop of the rotation into a soil free from weeds is a point of so much importance,

that every furrow slice should be carefully hand-picked, top and bottom, during the ploughing, an active lad going behind the plough picking right and left; and the whole field with as great care gone over a second time after it is harrowed. The propriety of this is owing to the fact that the land thus laid down lies two years under the same furrow, and that when broken up for the fourth crop, the operation of weeding can be less perfectly performed; while couch grass, and similar weeds, multiply so rapidly during the interim as to increase the amount of labour tenfold when the work is deferred until its expiry, or after the fourth crop is removed from the ground.

If the land under the first crop has been improperly cleaned, annual weeds having been allowed to ripen and shake their seeds, such should be brairded, if possible, before being ploughed into the soil. In late and cold seasons or climates it may be difficult to effect this, owing to the high temperature some require to make them vegetate; but in the generality of cases, if the land is harrowed (the bush-harrow being sufficient for many soils), and allowed to lie for a week or ten days, according to the kinds of seed and the length of time they require to vegetate, the object will be gained. In the case of potatoes, the work will require to be done before they are removed from the ground, as the digging would bury the seeds too deep in the soil. For this purpose, the tines may be removed from a common drill harrow, and a narrow bush-harrow substituted in their place, and any potatoes brought to the surface removed, to avoid harm. When the fourth crop is infected with charlock—a case but too common—the stubble may be harrowed immediately after the crop is removed, when the first warm shower will seldom fail in securing a braird. By repeated harrowings at intervals we have seen several close brairds effected in one season; and, difficult as such weeds are to conquer, this practice, if persevered in, will prove successful in the long run. In cold, late seasons, however, it is more difficult to get a braird, for reasons already stated.

The expense of weeding the land immediately after the removal of the first crop will never be more than a small fraction of that required to clean it after the fourth, when the weeds of the first crop are neglected to be removed. Under good farming, an active lad behind each plough will do the work, carrying the weeds to the headland in a light basket, thus cleaning an acre in a day. Under less favourable circumstances, two may be required; one turning in behind the plough at opposite headlands, thus cleaning one furrow while the plough goes "a round," or turns over two. At this time, creeping-rooted weeds, as couch grass, have little hold of the soil, and are more easily removed than at any other period of the rotation, either from the furrow turned over on the right hand, or the unturned soil on the left. On the land being broken up from grass, or even stubble, it is very different; for then the creeping roots are fast in a solid body of earth, from which it is impossible to separate them, especially in the case of clay soils, without the clodcrusher, while in number they will be increased more than tenfold. And where attention is paid to the cleaning of land after the first crop, the expense of weeding after the fourth will be nominal, while the expense of hoeing the second and fourth crops will be greatly reduced. In the generality of cases it may safely be concluded that the saving in the hoeing of the different crops will cover the expense of weeding them afterwards, on the defensive system.

The *modus operandi* followed by the lad after each plough is deserving of more special notice, and is simply this—on the left hand he picks the two under sides of the furrow before it is turned over, and on the right the two upper sides after it is turned over, so that scarcely an inch of couch grass, or other weed, can escape his notice, if he is active with both eye and hand. If on the right hand, for example, in the turned furrow, he observes a root of couch grass cut by the plough, he removes what is there, and immediately turns to the left for the remainder of the plant. We have done the work ourselves thirty years ago, when serving an apprenticeship, and can testify both to its efficacy and simplicity from that, and a long experience since.

In acting on the defensive, however, the most successful plan to keep land free from weeds, is to put it into a manurial condition unfavourable to their growth. This is unquestionably the golden rule, as we have already said; for it is notorious to the most obtuse observer, that weeds and cultivated plants never prosper in the same field together. With natures physiologically so different from each other, how could it otherwise be reasonably expected? Just as well, and far better, expect tame animals and wild to associate together, as to expect that our green crops, cerealia, &c., would associate with weeds. This does not arise from antipathy between them, or the one consuming the food of the other, but from their requiring a diversity of food. In point of fact, the latter are so much the pets of soil and circumstance, that every diversity in these has its own category; so that you have only to advance a little in the march of progress, when you get rid of weeds altogether, placing your lands in the most productive state for the growth of cultivated plants. On the contrary, the more lands are exhausted by our cultivated plants, especially where several corn crops are taken in succession, the more abundantly do weeds luxuriate in them, indigenous individuals always struggling for the ascendancy over those accidentally introduced from a different soil and climate.

Improvements in draining, cultivating, manuring, and cropping are doing much to place the land in this unfavourable state for the growth of weeds. There is scarcely a comparison between the quantity grown by those who have adopted the most recent improvements of this kind, and others who still follow old systems. We must here, however, make a wide distinction between imitation and reality; for there are not a few who have adopted the theory of progress, but who are yet a long way from its practice. Such are those, for example, who, "penny wise and pound foolish," only half drain their lands, and who, consequently, hardly get rid of a fourth part of the weeds peculiar to them, and of weeds that luxuriate in them when they have been laboured in

an over moist or poached state, as is always the case with such soils in wet seasons; those again who only loosen the soil to half the depth which the exclusion of weeds, such as thistles, demand, and who borrow their neighbour's new implements and machinery, because their own old things are not yet sufficiently worn out to be thrown aside; those who purchase inferior guanos, because they are cheapest, and who adopt the same short-sighted economy in the seeding and cropping of their lands, sowing inferior seed full of weeds, wheat instead of barley, barley instead of oats, and peas and beans instead of mangolds and swedes, or *vice versa*. A very superficial acquaintance with our provinces verify how many pseudo-improvements of this kind there are, and how far they fall short of what they profess to be. At the same time, every province presents numerous examples, proving that successful farming in each of the above branches is unfavourable to the growth of weeds, farms annually becoming more and more clean as they are improved.

It will thus be seen that the keeping of lands free from weeds greatly depends upon their proper tillage in autumn, or immediately after the crop is removed from the ground. From time immemorial farmers have been familiar with the fact that scourging systems of cropping are favourable to the growth of weeds, while ameliorating ones are the reverse, especially when too great a breadth of autumn tillage is grasped at, and the work, consequently, hastily and imperfectly performed. A notion has lately sprung up, it is true, that no systems are scourging IF the land is properly manured; but this theory is too fine-spun for the progress yet made, for the practical man must make several long strides in advance of his present position before he can comply with the conditions of this conjunctive hypothesis, those who have tried the experiment fighting an eternal warfare with weeds. Agricultural chemistry has yet much to do, in analyzing both weeds and cultivated plants, with the view of ascertaining the quality of food which each respectively requires, and the source from which it can most easily be obtained, before we can surmount the practical dilemma which this little IF throws in our way. Great as has been the chemical progress made of late years, much more must yet be accomplished before justice can be done to the details of so comprehensive a subject as placing the land in a state not to grow weeds. The farther we progress the greater the necessity of equalising the labours of the seasons, so as to be able to perform the whole with machinery and a given number of hands resident on the farm. And, from the peculiar position which autumn occupies relative to harvesting the additional quantity of green crops now grown, instead of merely sowing the naked fallows of the olden time, and the cleaning of this extra breadth of land, and getting-in wheat in proper season into it, improved tillage at this season is fast growing in importance. In the olden time, our forefathers wrought by "fits and starts," doing their work at certain seasons, and going comparatively idle during others; but this system is fast getting out of date, and will soon be altogether impracticable, for the want of extra labourers to comply with its demands. Steam engines are fast taking the place of a pauper population; and seed time and harvest, summer and winter, will have to acquiesce in this new and improved state of things. In one word, the progress now being made in agricultural chemistry and mechanics is pointing to a more uniform degree of fertility of soils—to an improved method of keeping land clean—to the equalisation and abridgment of the labours of manuring, relieving the land both in autumn and early spring from much poaching and damage; and, lastly, pointing to much more abundant harvests as a natural result of such improvements.

EUROPEAN WHEAT AVERAGES.

SIR,—In the present critical state of the corn markets of Europe, which seriously affects the current of gold flowing both from Australia and California, it may perhaps be considered interesting to show the relative annual average price of WHEAT during the last 26 years in the principal countries of Europe.

The free-trade in wheat which now exists in this country (for the trifling duty of 1s. per qr. will scarcely interfere) must tend to make England the universal mart for all corn-exporting countries. It has, however, been observed that as long as any other country has a deficient supply, the *market price* here must be influenced by the demand thereby created, and it will rise to the level of the price in such country, less the expenses of transport and profit. This difficulty is counterbalanced to a great extent by the constant supply under *free-trade*, which prevents the occurrence of famine prices, except when bad harvests are very general.

It is not long ago since capitalists were trembling under the apprehension that the new and great supply of gold would rapidly *increase* prices and *lower* the rate of interest, and even our financiers endeavoured to meet the popular opinion by creating a Two-and-a-Half per Cent. Stock. It will be found that such great changes can only take place slowly. A very trifling annual addition made to the money-value of any commodity will in a century assume a gigantic amount. We have seen this take place in the century following the discovery and introduction of the precious metals from America. Vast as the amount of gold may be, which is now annually poured into the world's treasury, still the effect produced is only a *per-centage* on the gross existing amount; but of what that amount may be, we have only a very vague idea. I believe that I might very safely predict that gold will continue for many years to maintain its value, and that the power of absorbing it from the commercial market will go on till a gold circulation will exist far more universally than at present, without anticipating the possible event of a diminished supply.

In a few days I intend to make up the weekly average prices of grain in England and Wales, for the year ending Michaelmas-day last, as the result may be useful

to the landowner and the farmer in fixing corn rents; which I hope soon to see more generally adopted.

I remain, Sir, your most obedient Servant,
CHARLES M. WILLICH,
Actuary University Life Assurance Society.
25, *Suffolk-street, Pall Mall,*
5th Oct., 1855.

ANNUAL AVERAGE PRICE OF WHEAT PER IMPERIAL QUARTER IN ENGLAND, FRANCE, BELGIUM, AND PRUSSIA, 1828—1853.

For the Year.	Average Price per Imperial Quarter in							
	England		*France		* Belgium		† Prussia	
	s.	d.	s.	d.	s.	d.	s.	d.
1828	60	5	51	1	45	9	30	11
1829	66	3	52	5	54	0	35	7
1830	64	3	51	11	47	2	34	0
1831	66	4	51	3	52	10	42	1
1832	58	8	50	8	48	9	34	6
1833	52	11	38	6	34	3	24	11
1834	46	2	35	4	32	2	23	6
1835	39	4	35	4	34	0	24	6
1836	48	6	40	2	36	1	23	4
1837	55	10	43	0	38	6	25	5
1838	64	7	45	3	49	1	33	10
1839	70	8	51	4	55	4	40	2
1840	66	4	50	8	51	6	37	6
1841	64	4	43	0	46	4	35	2
1842	57	3	45	4	51	5	38	11
1843	50	1	47	5	45	0	36	2
1844	51	3	45	10	41	2	30	7
1845	50	10	45	10	46	10	34	8
1846	54	8	55	9	56	3	46	3
1847	69	9	67	4	72	2	59	0
1848	50	6	38	7	41	7	33	6
1849	44	3	35	7	40	5	32	7
1850	40	3	33	2	37	5	31	6
1851	38	6	34	8¼	39	2	33	5¾
1852	40	9	41	4¼	47	0	38	7
1853	53	3	53	9¼	58	3	45	9½
26)	1425	11	1184	6¾	1202	5	906	5¼
Average of 26 years	54	10	45	6¾	46	3	34	10¼
1854	72	5						

* Taking the *hectolitre* at 2. 9 to the imperial quarter, and 25 francs to the pound sterling.

† Taking the *scheffel* at 5⅓ to the imperial quarter, and 200 silver *groschen* to the pound sterling.

MICHAELMAS RENTS ON CORN AVERAGES.

SIR,—For the information of your agricultural readers, and more especially of those who may have adopted the system of corn-rents, based on the average prices of wheat, or of wheat, barley, and oats for the farmers' year ending on Michaelmas-day, I beg to annex a statement of the averages for the year, founded on the returns published weekly and quarterly in the *London Gazette*, which I have arranged in a form convenient for reference.—I have the honour to be, sir,

Your most obedient servant,
CHARLES M. WILLICH,
Actuary University Life Assurance Society.
25, Suffolk-street, Pall-mall, Oct. 12.

AVERAGE PRICE PER IMPERIAL QUARTER IN ENGLAND AND WALES.

	Wheat.		Barley.		Oats.	
For the Quarter ending—	s.	d.	s.	d.	s.	d.
„ Christmas, 1854	68	0	33	6	27	6
„ Lady-day, 1855	69	11	31	10	25	11
„ Midsummer, 1855	73	4	32	6	27	3
„ Michaelmas, 1855	76	1	34	10	28	7
4)	287	4	132	8	109	3
For the Year ending— Michaelmas, 1855	71	10	33	2	27	3

WEEKLY AVERAGE PRICE PER IMPERIAL QUARTER IN ENGLAND AND WALES.

Per *London Gazette.*	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
Oct. 13, 1854	56	7·953	29	11·457	25	6·532
— 20 —	57	0·161	30	6·309	25	4·309
— 27 —	57	6·603	31	3·540	25	9·853
Nov. 3 —	60	7·442	32	1·698	26	6·396
— 10 —	68	0·928	33	6·766	27	3·901
— 17 —	72	1·408	35	0·635	28	7·388
— 24 —	72	11·498	34	7·273	28	4·918
Dec. 1 —	74	7·462	35	6·974	29	3·922
— 8 —	74	4·617	35	10·650	29	0·323
— 15 —	73	0.400	35	2·643	28	4·719
— 22 —	72	3·271	34	6·244	28	6·053
— 29 —	72	4·108	33	8·965	27	4·641
Jan. 5, 1855	73	9·483	34	1·917	27	10·339
— 12 —	74	3·812	34	5·645	27	5·708
— 19 —	73	9·923	34	2·396	27	4·797
— 26 —	72	2·981	33	7·900	26	11·116
Feb. 2 —	69	9·824	32	2·092	26	8·738
— 9 —	70	11·228	32	2·263	26	7·360
— 16 —	71	1·409	32	6·863	26	2·320
— 23 —	70	3·446	31	9·759	25	7·106
March 2 —	69	1·021	31	5·223	25	6·717
— 9 —	68	6·914	30	11·303	25	3·372
— 16 —	68	0·711	30	6·563	25	2·314
— 23 —	66	11·393	30	5·212	24	10·808
— 30 —	66	6·424	29	9·847	25	0·890
April 6 —	68	7·417	30	5·942	25	6·568
— 13 —	68	5·267	30	8·795	24	11·883
— 20 —	68	4·254	31	1·266	25	10·972
— 27 —	68	8·430	31	5·083	25	10·132
May 4 —	68	4·685	31	6·723	25	9·485
— 11 —	69	5.336	31	3·379	26	0·241
— 18 —	73	4·003	31	10·778	26	11·514
— 25 —	76	1·148	32	5·193	27	9·865
June 1 —	76	10·213	32	11·574	28	1·276
— 8 —	77	7·118	33	2·602	28	2·127
— 15 —	77	5·609	33	11·158	28	10·564
— 22 —	77	5·070	34	0·144	28	7·656
— 29 —	76	7·012	34	3·162	29	3·464
July 6 —	75	11·224	34	3·137	28	8·035
— 13 —	76	1·365	34	5·613	28	6·265
— 20 —	75	11·360	34	7·548	28	8·725
— 27 —	76	4·671	34	8·395	28	5·025
Aug. 3 —	77	7·487	34	8·645	29	1·590
— 10 —	78	2·738	35	0·216	28	11·708
— 17 —	77	7·825	34	8·769	29	1·321
— 24 —	75	9·510	34	2·752	29	1·193
— 31 —	73	7·528	34	5·055	27	6·826
Sept. 7 —	72	7·120	34	9·342	29	3·327
— 14 —	74	10·357	35	0·920	28	2·375
— 21 —	76	9·332	35	3·509	28	6·318
— 28 —	77	8·814	35	9·834	28	8·204
Oct. 5 —	77	3·160	36	4·178	28	4·484
52)	3741	0·553	1728	3.754	1424	3·683
	* 71	11	33	2	* 27	4

* By including the weekly decimal portions of a penny the annual average of wheat and oats is increased 1d.

ON THE BEST MODE OF CONSUMING AND PRESERVING THE TURNIP CROP.

At the meeting of the Knighton Farmers' Club, held on the 30th of August last, George Smythies, Esq., read the following valuable paper:—

"As it is of little use that we get a good crop of turnips if we do not turn them to profitable account, in this evening's discussion we will therefore consider the most approved methods of preserving root crops to the latest possible period in the spring, and the best modes of consuming them both early in the year and also those that have been preserved through the winter. It will, I think, be better to consider, first, the best manner of storing turnips, as I feel sure that the part of the crop intended to be set apart for spring consumption should be the first to be taken from the ground, having always found that those turnips kept best that had been pulled before they were quite ripe. It is frequently supposed that the swede is the only turnip fitted for winter storing, but this is not the case; the harder varieties of the common turnip—such as the purple-topped Aberdeen yellow—being well adapted to this purpose, provided they are taken from the ground before they have completed their full growth. It is important that this should be known, as upon strong or wet soils these turnips may be grown with advantage by being earlier sown and taken up before the autumn rains have saturated them. I need not mention to the practical men I see here, that if swedes and turnips are sown on the same day, the turnips will be ripe some weeks before the swedes, and, therefore, better adapted to sowing on wet or stony soils to be succeeded by wheat. I should suppose that no one could doubt the policy of drawing turnips early from land of this discription, but upon soils of a lighter character the custom of storing turnips is not so common as I think it ought to be; on lands that will bear the treading of sheep in wet weather without injury, it is too frequently thought to be an unnecessary expense. Every one that has grown a good crop of turnips is fully aware that it can only be done at considerable cost; it must surely, then, be very false economy to grudge a small outlay to preserve it for consumption in the best possible condition. If you cut a turnip through that has been well stored, and compare it with one that has been exposed to all the changes of temperature of a long winter, you must be convinced of the superior feeding qualities of the former, even supposing the latter be not wholly rotten and useless. In a hard winter like the last, the loss caused in this way by the frost is almost incalculable. Not only do turnips exposed to the frost become rotten, but they are bad food for stock whilst they are frozen, and they cannot even be taken up during a frost without great waste and loss. Besides the injury to the turnips caused by exposure to the weather, I have no doubt the land is robbed a good deal by letting them stay undrawn so long. I think, therefore, that it will be the truest economy on all farms to secure a sufficient quantity of turnips to carry us through the greater part of the winter and the whole of the spring. We will now, if you please, consider the cheapest and best mode of accomplishing this desirable end. In consuming the turnip crop, we must keep in view both the benefits to be derived by the land as well as by the stock; a good farmer will pay equal attention to his corn crops as to his cattle and sheep. We must bear in mind that if the whole of the turnips are removed from the field on which they were grown, the succeeding corn-crop will be an inferior one, particularly on poor light soils, and where artificial manures only have been used. On the generality of soils in this district I think it is best to take half the crop to the yards, for consumption by the cattle, and leave half to be eaten on the field by the sheep. Those for storing should be pulled when the land is tolerably dry, so that the soil may be shaken from them without much application of the knife, which should only be applied to remove the small roots and the tops, which latter should be cut off an inch from the bulb. A great deal of damage is frequently done by a too free use of the knife—the rind of the turnip should on no account be cut. The turnip should be pulled by hand and dressed at once, so as to distribute the manure equally, and not, as is too often done, pulled up with what is called a stocker, which makes holes in them, and then thrown into heaps and dressed there, by which rank places are made in the next corn-crop, causing it often to lodge there. I have found it the best plan to take every alternate eight rows, putting four rows into one on either side, which leaves a convenient space for the passage of a cart between them. There are various methods for storing turnips for fold-yard consumption, but I believe the best plan is to place two rows of five-barred hurdles at such a distance apart that a cart will just back up between them, wind them well with straw, and fill level with the top, and cover them with sufficient straw to secure them from the frost. Those left in the field may be thrown together into convenient heaps and covered with soil, in which way they will keep quite fresh to a late period in the spring. There are other methods of preserving turnips which are made use of by many, and which I have no doubt that others will speak of this evening, but I believe these two plans are as cheap, simple, and effectual as any. I should have mentioned that the turnips should not be put together when either wet or frozen.

"In consuming turnips, whether by cattle or sheep, care should be taken that they are ripe before they are used, as I am sure that when given in an unripe state they are as unpalatable and unwholesome to animals as unripe fruit is to ourselves. In giving them to cattle they ought to be cut into such slices as will not choke them, and given in quantities varying according to the age of the beast, and the purpose for which he is designed. When given to feeding beasts they are generally used in too large quantities, acting injuriously on them by over stimulating their kidneys; seventy or eighty pounds a day, in conjunction with straw and a little flour, will be found ample for most. The Royal Agricultural Society of England this year offered a prize for a machine to reduce turnips to a pulp, and several were shown at the meeting at Carlisle. This will, I have no doubt, lead to a great economy in keeping cattle, by enabling us to mix the turnips thoroughly with cut straw, in a greater or less proportion as may be thought desirable, adding a little flour or linseed for fattening stock, and making a small quantity of turnips a vehicle for consuming a great quantity of straw for store cattle. This, I feel confident, will be found to be a far cheaper mode of keeping cattle of all kinds than by giving them hay, and will also be found far preferable for horses. I feel great confidence that this machine will enable us to do almost without hay, so that we shall be able to graze our meadows, and by ploughing the uplands we shall have more straw and turnips for our stock, and more corn to meet the increasing wants of our population.

"In eating off turnips on the land with sheep, I like to com-

mence at the lowest part of the field; for if you begin at the top, the sheep having a natural tendency to go as high as they can to lie down, the upper part of the field gets an undue proportion of the manure. To promote also the even manuring of the land, the pen should be as small as possible, provided the sheep are not overcrowded, a small patch of fresh ground should be given them at least every other day, and though some portion of the turnips may be left for a time, the sheep will return and eat them up clean after a few days, when the ground has become sweet. In many of the best sheep countries they never allow the sheep to have any turnips, except they are cut for them; but I think that till frost sets in they do as well by eating them on the ground as they grow. When sheep are once put on to turnips they ought to remain there, and not be allowed to return to grass; I am aware that they often fall off in condition when first placed on turnips, which often induces farmers to let them have the run of a field of grass, but I am sure they do better in the end if they are weaned at once from the grass. No farmer having taken his lambs from the ewes would think of putting them together again, because they made a bleating and fell off in condition; he knows perfectly well that by so doing both lambs and ewes would be much longer becoming reconciled to their new lot. A similar case occurs when sheep are put on to turnips; the food being new to them they are dissatisfied at first, but if wholly removed from grass they become much sooner settled than if allowed to return to it. If my plan is adopted of having more root crops and less hay, it will be necessary to have a patch of common turnips ready early, to take the place of the aftergrass. By putting the sheep upon these you get them settled whilst the weather is fine; the custom is, I fear, to put them to turnips at the worst period of the year. If they are put on turnips early, and they are quite ripe, they will require no other food till the weather sets in wet, when they should have a little cut straw, that from peas being the best. When frost makes its appearance it becomes necessary to resort to the stored turnips, when they must be cut into small pieces and put into troughs. Matters should be so arranged that all the roots to be consumed on the land should be finished by the time that it is necessary to sow the spring corn, when the sheep may be taken to a grass field and penned on the poorest parts of it, giving them the roots stored the previous autumn; I say penned there, as I would on no account allow them to be under the trees and hedges, where their manure is not required. I have found nets to be more convenient than hurdles, being more easily moved; but if hurdles are used, they should be of the lighter description found in the southern and eastern counties, and not the heavy and cumbrous ones in common use in this district. I fear it may be thought by some that this plan is too expensive for most farmers, but for my own part I cannot think that any cost is too great that leaves a good profit, and I believe that the plans here advocated will not cost more than will be amply repaid; and what I would earnestly draw your attention to is, that almost the whole of the cost consists in labour, giving employment to the poor at a time of year when work is becoming scarce. I have found it a good plan to set the pulling of the turnips by the row, getting from 80 to 90 yards done for a penny. This enables the women and their stronger children to come out when it is fine or when they can spare time from their household duties."

After some conversation, it was proposed by Edward Bennett, Esq., and seconded by John Evans, Esq., that the thanks of the meeting be given to the Chairman for the able paper which he had read to the meeting.

A RAILWAY RAMBLE, &c.

Having completed my harvest, with a slight exception, I indulged myself as usual with my annual excursion, partly to gather information, but mainly because I love the recreation and enjoyment of it. In these palmy days of railway travelling, the temptation to look abroad is much enhanced by such unparalleled facilities, and I cannot but think the man a churl, or something even worse, and which I shall not designate, who habitually declines availing himself of such opportunities. I think the dullest traveller cannot return to his home without feeling himself advantaged by his tour. His powers of observation must be circumscribed indeed if he does not gather some knowledge by the way, to say nothing of a renewal of health and energy. The farmer, of all others, ought in these times of agricultural progress to look abroad, as well as around him, to see what is passing: new orders of culture or of cropping are continually promulgated; new modes of carrying out the various departments of his business occur. For instance, at this season of the year we have harvesting, *i. e.*, reaping, mowing, or bagging; stouking, heaping, capping stouks or shocks, stacking, thatching, and the like; again, autumn culture, *i. e.*, scarifying, and by what implements, ploughing, skeleton ploughing, or broad-sharing, &c.; and at other seasons matters of equal interest will constantly present themselves to his notice; so that, of all others, he is the man who ought occasionally to go from home, both for improvement and recreation. It may not always be that he gathers new or improved ideas; it is something if he is confirmed in the good practice he may have already adopted, and by which he is made to avoid improper courses, too often followed, and not unfrequently strongly advocated by others. Besides, farmers in general are recluses; they have one round of daily duties, and the same weekly market to attend to; their opportunities of observation and inquiry are therefore limited, and causes the more need for at least one annual excursion, having for its great object improvement. It is a great satisfaction to know that many are his inducements at the present era of British agricultural improvements. We have the meetings of our great and

highly interesting agricultural societies, Smithfield clubs, &c., to which he can resort, and of which he will avail himself if he desires to replenish his stores or expand his views. Humble farmer and writer as I am, I cannot let a season pass without my trip, lest my poor ideas should quite stagnate, and my bodily and mental energies should become weakened and impoverished. I have just returned from one of these delightful and interesting excursions, having set out with the view to see all I could by the way, without diverging from the ordinary routine of travelling, or staying by the way to examine particular objects of unusual interest.

In presenting my notes by the way to my readers, I would observe that my desire in this instance was more particularly to notice the progress made with the harvest, the modes of stacking and thatching, the modes of culture at this season, the mode of ploughing, and the various other matters of business peculiar to this period of the year, so that I might be able to give a fair account of the actual state and progress of it at the time I passed, for the comparison and guidance of other districts. The notes are few and disconnected, and I apologize for thus presenting them to the readers of the *Mark Lane Express*.

I left home on the morning of September 14th, and my first observations were commenced in the neighbourhood of Boston, Lincolnshire; and I could observe that the mode in which the farming departments of business is conducted in this district appears to prevail throughout the whole level of the fens and marshes south of Boston. The same mode of building and thatching of stacks, the same general order of culture for crops, *i.e.*, ridging for swedes and mangels, on the flat for common turnips and coleseed, &c., and the harvest in about the same state of forwardness; the mode of harvesting the same—mowing light crops, reaping heavy ones, and stouking or shocking all: no loose barley or oats stacked; the stacks, either the round Midlothian pattern or a well-built oblong, roofed in simple, safe style, as if for slating or tiling; the thatch secured by being well laid on, and merely fastened with three marline bands. The cattle depastured are all shorthorns, of excellent quality; the sheep, Improved Lincolns, and of good kind. About five-sixths of the harvest appeared to be secured, and in very fair condition; and a large crop. Beans a good crop, and nearly ripe. Potatoes, nearly all lost top; grass bare; turnips and coleseed a good plant, but suffering from mildew. As I left Boston the stacks began to assume a different shape: the round ones had a peculiar roof, in shape precisely that of the mushroom top, and the thatch was secured by a profusion of bands, from twelve to twenty-one marline bands being attached to thatch-pegs driven into the stack; this cannot be requisite. The oblong stacks had similar roofs, with hip-ends; the thatch secured with as many bands. The harvest nearly all up, and well done; chiefly mown. Grazing lands very short of grass; turnips mildewed. The whole of the crops fair, but not good. As I proceeded towards Lincoln, the green crops appeared poor and not cleanly, and the harvest somewhat later; mowing still prevalent, and the crops thin. Beans light; grass looked rather better. I first come upon game-preserves near Bardney; near Kirkstead the crops appeared rather better, and the harvest nearly all in. The country looks poor; the soil very unpromising to the right. The large fen to the left looks well, but the large gravelly moor to the right requires much management to make it productive. The corn is all mown, the grass and seeds are very bare, and green crops defective. The stacks here are chiefly small oblong ones, with hip-ends; thatched, with many bands, as before. There is much corn observable in the fields to the left.

Sept. 14th.—We approach to the fine old city of Lincoln, with its unique and beautiful cathedral, its fine old castle and asylums, all large and handsome buildings standing on the sides of hills to the right and left at considerable elevations; the city on the right sloping down to the railway, which passes through its midst; leaving, on the left, about a third of Lincoln on the flat or valley of the Witham, except toward the Canwick-road, where it again begins to ascend till you see the County Lunatic Asylum, of vast dimensions and no little beauty. Colonel Sibthorp's pretty little house and grounds are close by the city on this side. The district approaching Lincoln is apparently well farmed, and the crops are all harvested: mowing and stacking sheaf-corn are general. Sheep, Improved Lincolns: though rather small, they denote much good breeding. Cattle, all shorthorns, and good. On leaving Lincoln, the first object of attraction was the race-course, upon which were depastured a large number of cattle of all ages, and amongst them many cows, kept, no doubt, for the purpose of supplying the good citizens with that most useful and acceptable of all liquors—*milk*. The verdure here looked more promising; and the country as I approached Retford appeared to be well farmed, and the crops good. The turnips a beautiful green plant, and not much diseased. The stacks mostly assumed the old oblong sort, denoting a change in the fashion of building them. The grass good, and well grazed. Good sheep, longwools. Cattle good, shorthorns. Potatoes rather better in top: saw in a field to the right a variety in the crop, the result, I thought, of an experimental trial; one plot seemed to have retained its

green top and good appearance, while those on either side were more or less seriously affected. Passing along toward Worksop the farming seemed further to improve—at all events it was very creditable to the occupiers. Turnips good and clean: the swedes good, and not much mildewed; common sorts rather short in the quantity of acres, but fine. Corn all mown, as usual along this line; stacks, small oblong shape, thatched with fewer bands. There was some wheat yet uncut, and much corn to harvest. Barley to cut, &c. This is a good turnip district—good "strong red land." The grass varies as we pass along, turnips continue good, and barley not all cut. Kniveton Park: We now get to stone-brash with clay top; now again to the lime-stone rock. Along this line, toward Sheffield, I found more grazing carried on, with small dairies, &c. Wheat in shock, capped, and a good deal of the harvest to get in; the turnips not so good. The country now becomes abruptly undulating: hill-sides steep, valleys narrow, soil thin; seeds and clovers grown, to which lime is now being applied. We arrive amongst the mines: The clay strong; almost all farmers grow white wheats. Sheffield: No farming to be seen to any extent on either side, the chief aim being to grow hay and provide for dairying, &c.; and this, with occasional exceptions, appears to be the rule along the line to Manchester, where we soon arrived. We left Manchester for the old city of Chester, were soon on Chat-moss—that great field of suggestions for numberless agricultural improvers. I could not help wishing that some of our Lincolnshire or Cambridgeshire fen-men had charge of the district; I could easily in such case imagine the course of improvement they would adopt, and had no doubt whatever that, could they have their own way, and carry out their own mode of draining and farming, it would speedily assume a very different aspect, and become an ornamental and profitable part of our country.

I thought the "cotton lords" of Manchester much to blame for not adopting and carrying out some general measure for its permanent improvement, as it might be rendered almost invaluable to this city; it is a blot upon the face of the district, which ought no longer to exist amidst so much capital, enterprise, and industry. As we approached Chester I was struck with the change of fashion in which the hay and corn stacks were built; the same oblong or round shapes I saw in the neighbourhood of Boston, and which prevail in other parts of that district toward Spilsby and Louth, having hip-ends to the oblong ones, and mushroom-shaped tops to the round ones, and both secured on thatching with a great profusion of marline bands. I frequently counted from 15 to 24 bands on a roof of little more than 12 feet long. The green crops were generally good along this route, potatoes retaining much of their greenness: harvest backward, many fields of wheat and oats yet to cut: grass tolerably luxuriant, and dairying seems to be a considerable part of a farmer's business in the various districts through which we pass. The country sloping towards the Dee, and long ere we arrive at Chester, becomes a marshy flat, but apparently containing much good and very useful grazing land. The stock various—short-horns, Herefords, Welsh, Irish, &c. The sheep chiefly Leicesters, but not of first quality. The drainage appeared defective, not having the large and straight drains (rivers) which are cut for this purpose in the fen districts. The city of Chester possesses many objects of great interest to the traveller; but as I am only noticing the agricultural presentations as I passed along, I shall only just name that many respectable men have a good business in the sale of milk to the inhabitants. The cows are mostly depastured around the city, and the milk supplied with great regularity daily.

My route now lies along the Dee towards North Wales. As we pass along, I observe some defection in the farming. The land is not clean; but the turnip crops look healthy, and the potatoes retain their full verdure near Flint. The stacks near this place, and along the line to the right and left, are very small, round, and beautifully thatched, and secured with straw or sedge bands. The Welsh custom of thatching, or rather securing the thatch, is very effective and ornamental, but by no means requisite in all cases; it is by a complete net-work of bands. The bands are nearly all twisted straw, of about three-fourths of an inch diameter, and when evenly placed on an oblong stack, add much to its neatness. The usual practice appears to be this—the thatcher lays a succession of bands across the whole roof, which hang down on each side at about 15 inches apart; he has from 10 to 20 more bands wound around pegs, which he sticks into the end of the roof, on commencing at about 10 or 12 inches apart from the eave to the top of the roof; as he proceeds he nets all these bands in with the nicest regularity, and fastens them by driving in the required pegs along the roof, and the hanging bands are fastened into the sides of the stack by longer pegs; thus a complete cob-web or net-work of bands so effectually secures the roof that the stack itself must give way before the storm can disturb it. The same course is followed with the round stacks, except that the bands are fastened closely together at a point at the top, and radiate to the eave, and the horizontal bands are woven in, as in the oblong stacks.

THE WHEAT TRADE.

Sir,—We have now entered upon a new cereal year, and one which is likely, unless I am greatly mistaken, to try the resources of the country, so far as the supply of bread-corn is concerned, to a greater extent than any season for the last twenty years. Although from the application of science to agriculture, and the increasing use of condensed artificial manure, the average produce of our fields has been greatly increased, such is the effect of the increase of the population, that consumption is yearly leaving production farther and farther in the rear, rendering increasing importations necessary, and leaving us dependent upon the contingencies of foreign harvests for an ample supply of the first necessary of life. The partial failure of the crop of 1853 has revealed to us the inconvenience—not to say danger—of this state of things; for had we not fortunately had a good stock of old wheat on hand at the end of that harvest, it would have been impossible to have procured enough wheat for the consumption. And it is equally clear that had not Providence blessed us the following year with one of the largest crops that ever was reaped, we must still have suffered from a deficiency. This cereal year, however, is ushered in with indications of approaching scarcity—it is of no use suppressing the word—palpable and unmistakeable, and which, unless prompt and energetic measures be at once adopted to secure a supply where alone it can be obtained, will most assuredly be followed by a rate of prices which may lead to consequences fatal to the safety of the kingdom.

In all my former communications, I have endeavoured to avoid extremes, and rather to look on the favourable side of the question, so far as truth and conviction would allow. But, in the present instance, I avow that my object is to bring our merchants and politicians to a full sense of the condition of the country by stating "the truth, the whole truth, and nothing but the truth;" and I am the more induced to do this from learning that the former have repeated the error they committed in 1853, by sending out orders to the United States *with a limitation of price;* which orders, when they arrived, were of no avail, because that price was below the market; and, on the other hand, the French and German orders were to purchase at the market price, and they have consequently gained a month or six weeks upon us in obtaining the supply.

In my former letter*, I went over the circumstances of the past year as affecting the wheat trade, and shall therefore, on this occasion, no further refer to them than as they may incidentally require notice, to illustrate our present position and future prospects.

On looking over the estimate of "the general yield of the crops" in your Journal of the 24th ult., which corresponds in the main with the information I have received from other sources, I am now led to the conclusion that the crop of wheat will be rather below than above the average of 3½ quarters per acre. But assuming that to be the maximum and the breadth of land sown to be four million acres, it gives a produce of fourteen million quarters for the whole country. Were it not that in Ireland, this year, they have the best crop known for many seasons, I fear we should fall considerably below that quantity. The crops on the light lands are confessedly deficient—from one-third to one-half an average in many parts of the country; whilst the strong clays are, on the contrary, very productive. It is, in fact, one of the peculiarities of the season, that some of the most intractable lands, the cold wet clays, have the best crops of wheat; and we have heard of some such, the produce of which would this year purchase the fee-simple of the land. Assuming, therefore, that we have reaped this year a crop of 14,000,000 quarters, we must add to this 2,000,000 more, the stock of old wheat, native and foreign, which remained at the close of harvest, or rather say the 1st of October, for the harvest is not yet finally closed. This will give 16,000,000 quarters as the entire stock of wheat now in the country, being from 5,000,000 to 6,000,000 qrs. less than the year's consumption.

From year to year we have been looking to America for a supply of wheat in our extremity, and we ought to be thankful that we have been able to obtain so much from thence. But let me, once for all, endeavour to correct the exaggerated notions of the exporting power of that country, so prevalent with us, and which have originated in the boastful estimates and pretensions of the Yankees themselves. On looking over the Board of Trade returns, which are now before me, I find that we have imported from the States in fourteen years (from 1840 to 1853 inclusive) 8,614,324 quarters in wheat, and flour as wheat; being an average of 615,303 quarters per annum. But if we take the last eight years of the series, it amounts to 7,815,442 quarters, or 976,930 quarters per annum. The two heaviest years were 1847 (the year of the famine in Ireland) and 1853 (when our own crop was deficient). In both these instances, however, the export was strained to the utmost, so that in 1848 we only imported 296,102 quarters, and last year even less than that—the crop in the States having been a partial failure. But so completely was the country drained of wheat by the export of 1853, that they had none to fall back upon when their own deficiency arose; and their prices, in consequence, were beyond ours almost throughout the season, taking freight and expenses into the account.

America therefore, as well as ourselves, began this cereal year with an exhausted stock; whilst, on the other hand, the population of the States increases even faster than our own, or any European state; so that consumption keeps pace with production up to the present time, whatever it may do hereafter. They have,

* See *Mark Lane Express*, Sept. 2.

however, had this year an excellent crop, and a large increase of land under wheat, and will probably be able to export as much, if not more than in 1847. The question therefore is, what proportion of this shall we obtain?

It is now ascertained, to a demonstration, that the crops of wheat and rye throughout the whole of Northern Europe are lamentably deficient; and this is especially the case in the Baltic provinces, and from thence into the interior of Germany, where flour is at this moment at 70s. per sack. It will be useless for us to expect any adequate supply from thence this season; for they will rather be competitors with us in those markets where a surplus exists. The same is the case with France, for which country purchases are almost daily made in our own markets, and which has forestalled us in that of America, as we have stated above. France, in fact, will be an importing country throughout the year, and will materially interfere with the operations of our merchants in America. I am therefore of opinion that if we obtain a million or twelve hundred thousand quarters from thence, it will be as much as we can do.

From Canada we shall probably obtain some; but as the chief part of the Canadian corn comes by the way of the Erie Canal, down the Hudson, and so to New York, it is generally included in the exports from the United States. In looking over the Board of Trade returns, I find the imports from Canada direct, for the same period of fourteen years, to be 2,690,691 qrs., or 185,500 qrs. per annum. Nor have they increased, as we might have expected, from the extended cultivation of the country. The fact is, the superior facilities of getting it to the European market *viâ* New York, from the London and other south-western districts bordering on the Great Lakes, are quite sufficient to justify the growers in choosing that route. We shall, therefore, probably not get more than 200,000 qrs., if so much, from Canada direct.

From the Baltic countries we shall not obtain more than half a million, if we get that. Denmark and Sweden may have a little to spare, but certainly Prussia will have none; and our merchants are in the expectation of hearing that the Prussian Government has prohibited the export of wheat this season. What little old corn was lying at Dantzic, amounting to only 7,000 qrs., was wanted for the interior, and very little new was coming to hand. At Hamburg, too, the merchants are importing, instead of exporting, and have purchased in our markets. It will, therefore, be a hopeless thing to look for any supply from Northern Europe adequate to our wants.

In Spain, Portugal, and Italy we learn that the crops of wheat are good, and a considerable quantity will be exported from thence. But with the competition we shall have to sustain, it is impossible to form an estimate of what we can obtain from thence. Egypt will supply us with a large quantity; but as the chief part is taken by the distillers, and the quality is too harsh for the millers, it will tell but little in our favour. The Danube is now open to neutrals, and a considerable quantity has already been shipped at Galatz, which is on its passage to Western Europe. The French, however, have intercepted a large portion of it; and we suspect this will be the case throughout the season, unless our prices keep a-head of theirs.

Thus, with a manifest deficiency of five or six million quarters, without taking into account the absolute destitution of the usual stock of old wheat at the eve of harvest, we find a large proportion of our usual supplies cut off absolutely, whilst for those which are still open to us, we shall have to sustain a vigorous competition; and unless our prices continue immediately to advance and keep pace, or even a-head of those of our continental neighbours, we shall certainly find a heavy deficiency in the ensuing spring.

I do not expect a large delivery of wheat before Christmas. The price of malting barley has now reached 44s., which will induce the farmers to thrash that grain which has only a *seasonal* demand, rather than wheat which is *always* in demand. As soon therefore as the wheat-seeding is over, it is probable they will put the machines upon that grain, and reserve their wheat till spring, when the demand will be brisk and the foreign supply at a stand.

It will be seen by the above, that I anticipate higher prices for wheat; and I do not hesitate to say, that if we wish to stave off much higher prices in the next summer, the sooner we advance, so as to ensure a foreign supply, the better. For whilst our prices linger constantly behind those of France and Germany, that supply will inevitably be intercepted before it reaches our shores.

Yours truly,

London, Oct. 6th, 1855. S. C.

THE WHEAT CROP IN AMERICA.

"In my last, of August 17, I presented my estimate of the wheat crop in 1855. At that date, with the exception of that of the *New York Herald*, I had seen no higher estimate of that crop than 120,000,000 bushels. I have since had access to those of the *Courier and Enquirer*, 175,000,000, and the *Economist*, 140,000,000. That of the *Herald* was in round figures 169,000,000; mine, 185,000,000. If the figures of the *Herald* and of the *Courier and Enquirer*, for Ohio, were corrected by mine for that State, our several estimates would differ but little in the aggregate.

"The next question of interest is, what will be our surplus? Not a question for ready solution, because that surplus is as elastic as india-rubber. It depends entirely on circumstances. If Europe wants wheat or flour from us, and is obliged to pay, as lately, high prices, it is difficult to limit our surplus. Unless her harvests fail to an extraordinary degree, we have enough to supply all her wants. Paradoxical as it appears, the more she wants the more we have to spare, and the less she wants the less we shall have for export. If she want none, we shall have none for export. The surplus will in that case be used

freely at home, and, beyond that use, what is not required for seed will be stored away for the next season's sale for home or foreign consumption. If, on the other hand, high prices rule, less wheat will be used at home. Indian corn, potatoes, &c., will take its place extensively, and the shipments of wheat and flour to Europe of this year's crop surpass for quantity all precedent.

"For the purpose of illustrating my views, I submit a table of our annual product of wheat since 1839, together with our exports of the article from the same date. Any one familiar with such subjects will discover that it has cost labour and time to prepare it.

"UNITED STATES' CROP AND EXPORT OF WHEAT FOR A SERIES OF YEARS.

Year.	Crop. bushels.	Exports. bushels.
1840.....	84,833,263	11,198,098
1841.....	98,980,727	8,447,670
1842.....	102,317,240	7,235,998
1843.....	100,310,356	6,025,346
1844.....	95,697,000	7,751,787
1845.....	106,548,000	6,365,866
1846.....	94,455,412	13,268,175
1847.....	118,330,155	12,309,972
1848.....	114,245,000	26,312,431
1849.....	126,364,000	10,366,417
1850.....	104,799,250	8,656,982
1851.....	110,032,394	13,948,499
1852.....	117,511,501	18,680,686
1853.....	121,136,048	18,958,993
1854.....	132,023,690	27,000,000
1855.....	110,170,000	2,000,000
1856.....	185,000,000 (?)	———

"The years given above are taken of the export, not of the growth, being of course one year later; the fiscal year of the United States ending June 30. Thus, for example:—The crop of 110,170,000 bushels, set down against 1855, refers to that harvested in 1854; and the 2,000,000 bushels exported in 1855, or up to June, 1855, is from the crop harvested in 1854.

"The export figures for 1854 and 1855 are obviously approximations merely; and, although I would not hold myself responsible for the absolute accuracy of the export returns, I doubt not that they are substantially correct. They prove two or three important facts. It is obvious by this table that the quantity of wheat exported from the United States is entirely independent of the amount of the existing crop Thus the exports of 1848 and 1854 are in quantity double. those of 1847 and 1849, although the product of the first-named years did not exceed those of the last two. The exports of 1840 and 1846 also doubled those of 1843 and 1845, although their crop was not so abundant by 15 per cent. The exports of 1852 and 1853, on a crop of less than 239,000,000 bushels for both years, were more than 37,500,000 bushels; while the exports of 1842 and 1844, on a crop of nearly 200,000,000 bushels, hardly reached 15,000,000 bushels. In all those years it was the foreign demand stimulating high prices here which enhanced the export, as it was the absence of that cause which diminished the exports of others. If the foreign demand did not enlarge the export of 1855, it was not because the wheat crop had failed to any great extent, but because the drought of 1854 had so cut short the supply of corn, potato, &c., as to compel a larger use of wheat than would otherwise have taken place.

"Our plenty this year consists not mainly or chiefly in the fact of the large crop of wheat itself, but in the variety and abundance of substitutes for wheat, to which we can and do resort when the motive of wheat at high prices induces us to do so. Abundant as is our crop of wheat, it is but one item, and not the largest. Among others our oat crop of 1855 cannot be less than 400,000,000 bushels; other grain of less importance, not short of 100,000,000. But all this is nothing to the yield of corn, which is almost as safe as if it were already in the granary, and cannot be put down at less than 1,000,000,000 bushels. It may exceed those figures 20 per cent. I repeat it, there is hardly any limit to our surplus of wheat, beyond the crop itself. And if the demand abroad should carry off 100,000,000 bushels, or even more, which is almost four times as much as we have ever exported in one year, there would be enough left to feed Cincinnati consumers of flour, of those who would prefer to pay 7 dols. per barrel to using cornmeal or other substitutes, and other points at corresponding rates.

"If, from a variety of causes, wheat should not to any great extent be wanted in Europe during the current business year, the article will undoubtedly be low at home. In that contingency it may not bring more than 1 dol. per bushel in this market, which would be putting flour at 5 dols. per barrel."—*New York Daily Times.*

ON THE PRESENCE OF CLERGYMEN AT AGRICULTURAL MEETINGS.

There was but a few years since a very popular notion amongst a certain class of self-styled "Liberals" which went to declare that the less a clergyman was heard or seen out of his pulpit the better for him, and everybody else. It was considered, indeed, rather a meritorious action to either directly or indirectly sneer at such of the cloth as ventured to appear on any public occasion not immediately associated with the routine duties of their ministry. They were out of place. They were not wanted. They should mind their own business, and so on. It might, perhaps, have been difficult to define where this said "business" ended; or how far out of place an English clergyman could be, at any gathering of his neighbours, the object of which was not of an immoral or injurious tendency. However, so it was. "The parson" was recommended to keep to his books, and to let his friends improve their condition or establish their rights without any aid from him, notwithstanding his readiness and ability to give it.

This has died out at last, with many other as curious and contradictory "liberal opinions." It is still satisfactory to remember that even in the worst of these times there were meetings at which the parish clergyman was always received with welcome and heard with attention. There was no question as to his being in place here; and, in fact,

there was no place, out of his own church, where he could more becomingly claim a seat and a hearing. He came as the connecting link between three important classes, while he generally appeared as the especial champion of one of these. Almost equally the friend of the landowner and occupier, he met them at their joint gatherings as the recognised advocate of the labourer. If the chairman represented one rank in life, and his tenant another, so assuredly did the clergyman a third. We repeat, too, that in this character he has always been welcomed. We never recollect being present at any local agricultural meeting where "the Bishop and the Clergy" were omitted in the toast list. Though "The Army and Navy" could have been so strangely passed over at Carlisle, no one present can forget in how good and appropriate an address the Dean replied to that compliment which the Council had not been unmindful to pay the Church.

What we would have is more of these addresses —not sermons, but good practical remarks and advice. The claims and wants of the labourer can never come from a better quarter, and never be put at a better opportunity. When landlord and tenant are discussing, as freely as they now do, their relative duties to each other, let their mutual friend remind them of what they may have yet to do for another. We say emphatically, that if these occasions are not made the most of, it will be the clergyman's own fault. He is sure to be well received, and almost as sure to find what he says attended with some effect. Let it never be forgotten that one of the most important and vigorous movements that has for some years been made by the landlords and farmers of the North, is altogether attributable to an address delivered by a Scotch clergyman to the members of an agricultural society. It was on a subject, too, which very happily united the office of the speaker with the duties of his audience. We may have the clergyman himself renowned as an agriculturist—eloquent, like another Trulliber, on the feeding of pigs, energetic on the sowing, or more impressive still on the growing of wheat. Depend upon it, however, the first duty of a parish minister, in a party of landowners and their tenants, is that the Reverend Harry Stuart has so clearly pointed out to us. It would seem, indeed, as if such an assembly were at least in some degree convened for his especial purpose. When else could a village pastor command any meeting so able to assist him in adding to the comforts, or improving the position of the labouring man, as when amongst the most powerful of those who employ him? At meetings where, most probably, premiums are offered and claimed for good conduct, and when he should be the first to speak to the merits of those thus distinguished! So far from being out of place here, we question very much whether his presence can anywhere be more becoming in its character or beneficial in its influence.

There are many causes which have conduced to make the meetings of the Buckinghamshire Agricultural Association more remarkable than the common run of such celebrations. There has often enough been some point to be seized on, or some manifesto to be looked for. From the days of the Marquis of Chandos to those of Mr. Disraeli the proceedings here have invariably been watched with some attention. Of late, however, they have come as strictly within the business of an Agricultural Association as any other institution professing a similar object. Mr. Disraeli has confined himself entirely to the subject matter before him—the advantage such bodies confer upon all classes of a rural population. At the last anniversary, as, if we recollect aright, at the one preceding it, the good policy of imbuing the labourer with a personal interest in these occasions was the point chiefly dwelt on. In following this out, as well as in proceeding through the toast list, it became apparent that, in Buckinghamshire at least, however well the working man might be disposed to take his part, he did so with little sympathy or support from the clergy. There was only one of the latter present to return thanks for himself and his brethren. In doing so the Reverend Mr. Young expressed a regret, which we believe will be shared by others. He was sorry to find himself standing alone, where he thought many of his fellows might as fitly have attended. We think so, too; and that any endeavour to incite the labouring poor to a better appreciation of the advantages arising from good conduct and honest industry should hardly pass without the countenance of the country clergyman.

It is yet satisfactory to see that all have not failed in this. In the gatherings of the season some have already been found to take up the labourer's case, and, as in the North, to touch chiefly on his first want. Do what you will in other respects, it is hardly possible to make him a good servant—the much less a good man — without a decent and comfortable home for himself and family. Thus at the Northamptonshire Association, the other day, Sir George Robinson went at once to the point, insisting not only on the question as one of morality, but almost equally as one of self-interest to those with whom it rested to provide this better accommodation: "The condition of the agricultural labourer was a subject which had for many years been his hobby. There were some who thought that by bringing the labourer to a fine church, and inducing him to stay during the service, he would be brought to greater prosperity; others thought that by edu-

cation he was to be made a good man. Now, he had his own hobby. He did not believe that either churches or good schools would ever be instrumental to any great extent in bringing up a moral population unless they were provided with ample house-room. His own opinion was that the want of sufficient house-room—the crowding of the population in small houses—was one great source of the depravity throughout the land. He believed that if landlords would erect cottages for their labourers to live in decency, they would not only reap a reward in improved and increased work, but be conferring an enormous benefit upon all classes. This was a work which must depend mainly upon landlords and landowners and the rich."

Again, at the meeting of the Woking Society, the Reverend Mr. Morres goes yet more minutely, and, as a consequence, more forcibly, into the subject:—"He was extremely anxious to see that greater comfort in the way of accommodation was afforded the labourer in his house, and he reminded them that unless something more was done to add to the social comforts of a family, it was not very likely they would be able to effect any great moral improvement. If cottages were not rendered more convenient and comfortable, it could not be a matter of surprise that the men should go elsewhere. On the last occasion he mentioned the defects in the law in respect of this matter—that there was a want of power to compel the owners of such property to put it in a proper state for the health of the occupants; but now he perceived that by the General Board of Health a power was given to ventilate houses, open drains, build proper conveniences, and generally to take such steps as might be considered desirable for the improvement of the public health. He thought it was not sufficient for them to hold out an inducement for the labourer to keep at home, but they should do all they could to rear up a better race of children. In some places he visited, the accommodation for families was of a character that must produce the most painful results, both physically and morally. He could mention thirty houses where there was no outlet at the back part, there was no window in the sitting-room, and only a very small square of glass in the bed-room. He would leave them to say whether from families shut up at night in a sleeping apartment of that kind, and especially persons who were not particularly clean in their habits, they could raise up a very healthy class of children. This was a matter which demanded attention; and he trusted in time to find the homes of labourers, by a little liberality on the part of landlords, become more comfortable and suitable for their varied wants."

There can be no doubt that in the first instance this is a landlord's question. As Sir George Robinson says, "it is a work which must depend mainly upon landowners and the rich;" or with Mr. Morres, that has to trust for a little more "liberality on the part of landlords." In Scotland it has come to be so considered. The clergy are doing their duty; and the landowners, now thoroughly aroused, will do theirs. The Duke of Buccleugh, Lord Kinnaird, and in fact every proprietor who takes anything like a due interest in the management of his estate, have been taught to look upon it as a matter personal to themselves. A good faithful servant badly "housed" is at best an injustice, if not an impossibility.

THE LATE PROFESSOR JOHNSTON.

The death of Professor Johnston will be felt by our readers as no ordinary loss to agricultural progression. The grave commonly terminates all feuds, lulls all storms, allays all jealous feelings: the merits of the dead are then freely acknowledged. Such must ever be the fate of all men who labour in fields like those in which Johnston toiled — grounds in which he was sure to be met by the close scrutiny of able rivals—the steady opposition of the lethargic, as well as those who believe in the absolute perfection of English practical farming.

The late Professor for many years to come will fill a large and honourable space in the history of agricultural chemistry.

More than half a century has now elapsed since Sir Humphrey Davy commenced, in 1802, the course of lectures which laid the foundation for that great branch of science to which Professor Johnston long and successfully directed his attention. Davy's were the first and the most difficult efforts: he had to begin from the very foundation; he had no precedents to guide him; he warned his readers, in his opening address, that the inquiry presented many difficulties. The science had been pursued by competent experimentalists for a short time only: the doctrines had not as yet been collected into any elementary treatise, and he very modestly felt diffidence as to the success of his undertaking. These doubts, however, were rapidly dispelled as he proceeded; and before the publication, in 1812, of Davy's Elements of Agricultural Chemistry, it had become generally understood, amongst the leading farmers of England,

that this branch of science had done much for the farmer, and was about to accomplish still greater things for him.

When the grave, in 1829, closed over the remains of Sir Humphrey Davy, Professor Johnston was in his thirty-third year, and he must be regarded as one of the first eminent chemists who devoted himself to the continued exploration of those paths of scientific inquiry which Davy had, as it were, discovered. His practical results speedily outstepped those of his great master. He was soon aided and supported by a new generation of agriculturists, with far more general knowledge, and much more energy, than those to whom Davy had to address himself. Johnston associated more with the cultivators of the soil. He soon saw that the farmer and the philosopher must search through the fields and the farm-yard hand-in-hand, and that it was useless to travel separately. He felt, too, that it was essential to the accomplishment of any enlarged benefit that the chemist should render himself intelligible to non-scientific readers, and that he should avoid as much as possible the dry nomenclature of the chemists who preceded him. All this he happily accomplished. He not only carried on his numerous manipulations with more skill, and in a far more accurate manner, than those chemists who preceded him, but he rendered the subjects on which he dwelt popular and attractive by the ease and spirit with which he described the results of his labours and observations. The caution, too, with which he proceeded soon gained the farmers' confidence. In the first report in which he appears as the author of any paper, in the *Quarterly Journal of Agriculture* (1841, p. 401), we find him, when addressing the members of the Highland Society, at Berwick-upon-Tweed, upon the connection of agriculture with chemistry and geology, after suggesting the trial of various mineral substances as manures, warning his hearers to beware of putting themselves to any cost which they could not afford to lose. His labours on the subject of manures were most important and successful. We remark him, in 1842 (*Trans. High. Soc.*, vol. xiv. p. 503), in the first paper which he contributed to that valuable collection, suggesting a variety of mixtures as fertilizers for the improvement of oats growing on moss. In this he alludes to the use of sulphuric acid, both alone and combined with bones; indeed, his work on the elements of Agricultural Chemistry and Geology, published about this time, was the first which described the use of superphosphate of lime by Mr. Fleming—a discovery which we believe arose from trials which Johnston originally suggested; and if we search the *Journals of the Royal Agricultural Society of England*, we find, in their second volume, p. 301, the first of the several essays of Professor Johnston which graced their pages. He there dwelt, in his usual happy manner, upon the guano of Peru, which had just then (1841) been for the first time imported into this country. He thought it too valuable a manure for the Government of Peru to long allow of its exportation: this apprehension has proved groundless; but he well foresaw the (indirect) good results which would arise from its importation; for, as he observed, "The introduction of it into this country will prove a great national service, if it shall teach us to imitate so valuable a natural production, and, by making available those articles of home manufacture which have hitherto been neglected by the agriculturist, to supply the lack of farm-yard manure, and thereby to raise a greater amount of food than we should otherwise be able to do. Thus at the same time will the chemical arts and the art of culture be bound together by still another tie, and the mutual dependence of all classes of the community, however apparently distinct their industrial occupations, be still more distinctly illustrated."

In his subsequent papers in that journal will be found—as, for instance, in his Agricultural Tour in Denmark, Sweden, and Russia (vol. iii. p. 400, vol. iv. p. 196)—the same proper union of science with practical details which are so well and intimately blended in his other works—a graceful admixture which, though long familiar to the agricultural student, the general reader has more recently recognised in his "Chemistry of Daily Life." We may distinguish in the labours of the late Professor J. F. Johnston these great leading principles—an ardent love of science and of practical farming, united with an anxious and ever-cautious desire to avoid leading his readers into expenses for which they might not meet with an adequate return. And we so believe that our readers will deeply share with us those feelings of sincere regret which the loss of such a warm friend of agriculture naturally occasions. He died, at Durham, on the 18th of September, in the fifty-ninth year of his age.

FACTS ABOUT MILK.—Cream cannot rise through a great depth of milk. If milk is therefore desired to retain its cream for a time, it should be put into a deep narrow dish, and, if it be desired to free it most completely of cream, it should be poured into a broad flat dish, not much exceeding one inch in depth. The evolution of cream is facilitated by a rise, and retarded by a depression of temperature. In wet and cold weather the milk is less rich than in dry and warm; on that account more cheese is obtained in cold than in warm, though not in thundery weather.

THE ASSUMED SCARCITY OF AGRICULTURAL LABOUR.

The year with every one of us is fleeting away, whilst to the farmer the ingathering of his harvest denotes that it is ended. Seed-time and harvest, the Scripture informs us, shall never fail, neither shall the poor cease out of the land. Most important truths—yearly—nay, daily inculcated and impressed upon us, as each revolving year brings its return of seasons, of months, and of days. The rejoicing of the people and the joy of harvest has resounded on every side: a happy and blessed contrast to the stern necessities of war—devastating countries, and scattering death, disease, and misery in its train.

Still, surrounded as we are with blessings, such is human nature, that we court misfortune, and seek out cause for murmuring and complaint, just as refined natures become afflicted by minor causes, which the rude and unsophisticated shake off without heeding beyond the momentary feeling they impart.

Farmers, of all men, are accused of being grumblers—not perhaps that they are more so than merchants and traders, whose good or ill success may depend upon circumstances over which they have no control. The farmer is liable to be affected as sunshine or rain may prevail—as crops may become impaired by parching drought or sudden and continuous rain, blight and mildew, storm and tempest, and last, though not least, a surplus or deficient amount of labour at various periods of the year. It is to the last subject we now address ourselves, as the more greatly influencing his progress and success during the harvest. Some lament the scarcity of labourers as consequent upon the drain that has taken place by emigration, by the war, and by the farmers passing the labourer over during *forty weeks* of the fifty-two of which the year is composed.

The great fluctuations, however, that apparently take place in the agricultural labour market do not arise so much from a surplus or deficiency of labourers, as from all descriptions of grain fluctuating in quantity and becoming ripe simultaneously. And this can be gathered by referring to the various agricultural reports that have appeared in this paper; most of them stating that the barley and oats were the first crops ready for cutting, and that the wheat, in place of being from seven to ten days earlier, was in this season a few days behind them; thus bringing the entire operation of cutting the whole of the grain crops together. And again, from their lodged state and large amount of straw the labour of cutting and gathering them has been increased fifty per cent.; whilst in many districts haymaking and harvesting were in full operation at the same time; and from the prevalent wet weather that existed previous to the commencement of harvest, every description of root crop had of necessity become neglected, and the labour of hoeing had consequently to be supplied, or the crops suffered to be spoiled altogether.

We have endeavoured to point out the causes that really have operated to produce the result that has taken place. Labourers have rather become scarce from there having been nearly double the quantity of work to be executed in a given time than from any serious abstraction of a large amount of labour from the market—fluctuations which have always happened, and which will as assuredly again take place.

The improved system of cultivation that has of late been adopted has doubtless extended the acreage, and in many cases doubled the produce; whilst on all hands the bulk of the crops has been materially increased. This improvement has been gradual, and has been met to some extent by the adoption of machinery. Reaping machines through their comparative novelty have as yet certainly effected but little; though, in such a season as the present, farmers ought surely to resort to the most expeditious mode of cutting wheat. The scythe, when skilfully applied, will effect nearly double the quantity that can be cut by the sickle; and by the assistance of women and boys, as binders, its progress may fairly be calculated to exceed fagging or reaping to that extent. The wheat cut by the scythe also becomes soonest ready to carry, and has been proved to resist the effects of wet weather in a superior degree; yet even during the present harvest we have seen whole districts where it is not yet applied, and where the least expeditious and most expensive modes of cutting by reaping and fagging continue to prevail.

The labourer is worthy of his hire; and in many instances has realized a sum which, if prudently managed, would help him through an otherwise-expensive winter. But, alas! large earnings are usually of little benefit to the majority of the labouring classes. "Light come, light go," is their favourite maxim; and many of them will doubtless conclude their harvest-month without

retaining an additional shilling. The farmer, on the other hand, has been paying, at an exorbitant rate in too many cases, at least from five to six shillings upon each quarter of his wheat crop produce for reaping only. With a bountiful crop, high prices for in-gathering are little felt; but with crops beaten down, and the quality depreciated, should he chance to grumble, let it not be said that it is altogether without a cause.

PREVENTIVE OF ACCIDENTS TO PERSONS ATTENDING THRASHING MACHINES.

Sir,—Knowing how readily you insert in your journal any information that you consider may be of use to the agricultural body, allow me to call your attention to the numerous accidents that have occurred in the use of thrashing machines, and as I am not aware that any plan has been adopted to prevent them, to recommend one that I consider to be a certain preventive. My method is simple, and may be obtained at a trifling cost. I fix on the stage of the thrashing machine, near the end of the hopper, two upright iron rods, about 4 feet high; these are screwed to the boards of the stage, or fastened on in any way that will enable them to be removed to the other end, when necessary. A strap or girdle is put round the waists of the individuals who untie the sheaves for the feeder; the girdle is passed through a loop at the end of another strap, to which are attached two or three iron rings. One of these rings is slipped over the top of the rod; and this allows sufficient room for the persons so fixed to do their work without the least inconvenience, and renders it impossible for them to slip or tumble into the hopper. The feeder may be secured from accident in a similar manner. In this case the strap should pass over one shoulder and under the other; another strap or cord fastened to it behind, and attached to a hook in the stage, effectually prevents him from falling on to the drum.

I think it probable that some labourers may object to this plan; but the number of accidents that have occurred render it necessary that masters should insist on their adopting it.

In this immediate neighbourhood two instances have lately taken place: one of which happened to a feeder, a young man with a family, and a first-rate labourer, who pitched forward on to the drum, and had his arm torn off; the other to a woman, the mother of seven children, who slipped on to the drum, and was so much injured that death ensued. I mention these cases to induce all who use these valuable machines to take the necessary precautions to prevent such melancholy occurrences.

I am, sir, yours very truly,

Choice Hill, Oct. 5. Thomas Huckvale.

HARDY AND SON'S EXPERIMENTAL WHEAT CROP.

Particulars of Hardy & Son's Experimented Prolific Red Wheat Crop (2 a. 3 r. 6 p.), sown at Maldon, Essex, in October, 1854, on 12 various Plans, with only 1 Bushel and 5 Pints of Seed, on half-rod Stetches, as follows:—

No.	Contents.	Produce of Corn.	Equal to, per Acre.	Straw	Equal to per Acre.
	a. r. p.	bus. pk. qt. pt.	bus. pk. qt. pt.	lbs.	tn. cwt. lb.
1	0 1 26	12 1 6 1	30 0 4 1	1682	1 2 98

3 stetches sown broadcast, at 2 pecks per acre. Could not be well cleaned.

**2	0 2 23	24 3 4 0	38 2 4 0	2922	2 0 59

4 stetches sown in drills, 4 rows on a stetch, 2 feet apart, with 4-feet furrows, at 1 peck per acre.

*3	1 0 32	39 1 6 0	32 3 4 0	4295	1 11 107

8 stetches sown in drills, 4 rows on a stetch, 2 on each side the 4-feet furrows, at 1 peck per acre, with 4-feet spaces in the middle for potatoes, 1 row. Potato produce, 50 bushels per acre, early and sound.

4	0 0 23	6 0 7 0	43 1 0 0	708	2 4 0

1 stetch sown in 8 rows, drilled, at 1 peck per acre, with 4-feet furrow.

**5	0 1 22 / 2 3 6	17 3 4 0	46 0 4 0	2214	2 11 17

3 stetches dibbled and dropped, at ⅓ peck per acre, and reduced to 6 pints by thinning to single plants, with 4-feet furrows, 8 rows on each stetch.

6.—1 rod of 4 kinds, sown at the end of February, in equal quantities, 1 foot apart square, or about 6 pints per acre. Produce, 19 pints, equal to 47 bushels and 2 pecks per acre; straw, 30lb., equal to 2 tons 2 cwt. 96lb. per acre.—*Note.* This did best, and did not get blighted so much, but is considered quite an exception, and not a rule best to act upon.

7.—3 rods transplanted in spring 1 foot apart. Thin sample, and a partial failure, not being transplanted, as it should have been, in October. Produce, 21 quarts, equal to only 35 bushels per acre; straw, 68lb., equal to 1 ton 12 cwt. per acre.

8.—8 yards each of 2 kinds, planted between another full crop. Produce of each 3 yards, 2½ pints, equal to 63 bushels and 1 pint, or 7 qrs. 7 bush. 1 pint per acre.

9.—17 plants on 1 yard, 1854, not surrounded by other crops. Produce, 466 ears, containing 1 quart, equal to 18 qrs. 7 bush. 1 peck per acre! Subsoiled.

10.—1 yard on the very same spot, 1855, planted, without stirring the soil the same minute the crop of 1854 was cut. Produce estimated as good as last year. Both specimens are reserved for public inspection and criticism.

11.—2 yards of oats. Produce, 3 pints, equal to 14 qrs. 1 bush. 1 peck 6 quarts per acre. Blighted.

12.—3 yards of Peruvian barley. Produce, 2 quarts, equal to 12 qrs. 4 bush. 3 pecks 2 quarts per acre. Blighted.

13.—3 yards of common barley. Produce, exactly the same as the 3 yards of Peruvian. Blighted.

(Nos. 11, 12, and 13 were at the rate of 1 peck of seed per acre.)

Note. All were more or less blighted, as other people's of 1855, and much devoured or destroyed by sparrows, being near the town, estimated by all observers as at least 1-20th of the entire crop.

* Plans most recommended.

Hardy and Son, Seed Growers.

Maldon, Essex.

THE AGRICULTURAL MEETINGS OF THE AUTUMN—THEIR TONE AND CHARACTER.

It is at this season of the year an almost engrossing duty to follow up and watch over the many agricultural gatherings now being celebrated in different parts of the country—utterly impossible as it would be to report them at length. Such of our friends, then, as have been kind enough to forward us particulars of those meetings in which they are more immediately interested, must receive this as a necessary reason for their wishes not being always carried out. This attention, however, is seldom without an effect. There are few such occasions but furnish some topic, or dwell upon some point that is likely to come sooner or later into more prominent and public service. There was a time when the anniversary of an agricultural association was wont to be treated as little better than a good joke. There was sure to be something or somebody to get a laugh out of. But that day is gone by. At least there has only been one such opportunity in all the many meetings of the autumn; and this, again, was provided by the elect of Essex. It must still be borne in mind that the farmers themselves took no active part in these performances. All the irrelevant eloquence so bountifully provided here may be fairly claimed by "the clergy and gentry," one of the chief hits being the abuse of a dead man. It was only last week that we had to speak to the good the clergy were doing by their presence on such occasions. We had no idea, however, of associating their addresses with worn-out politics. Whatever may be the ultimate position of Sir Robert Peel as a statesman—whatever reverses the farmer may hereafter have to encounter—does any sane man imagine that talking protection or reviling Sir Robert can now do anything but injure the cause and the character of the agriculturist? We must, however, repeat that this Essex demonstration is altogether exceptional, and that the farmers of the county are but little implicated even here. The very copy of the *Times* which ridicules what took place there has a paragraph running side by side with this commentary, showing what an agricultural society *should* do, and what such bodies generally *are* doing. It opens thus:—"Agricultural Meetings in the West.—The agricultural societies in Devonshire, which are established for the encouragement of good ploughing, improvement in the growth of roots and the breed of cattle, have commenced holding their annual meetings. Considerable advantages to agriculture have resulted from the operations of these societies. It was stated at the meeting of the North Molton and Twitchen Society (North Devon) held last week, at which Lord Poltimore presided, that whereas 120 acres of roots badly managed were cultivated in the district when the society was formed a few years ago, there were now 1,000 acres appropriated to the cultivation of roots, which were well managed and were very prolific."

This, and much more of the same practical nature, is what our agricultural gatherings must now be devoted to. But enough of this. Let us change the venue, and seek elsewhere something more worthy of consideration.

In the evidence taken before the Lords' Committee on the collection of statistics, we had to remark on the little opportunity allowed to the agriculturist himself for expressing his opinion. Since then the subject has frequently been touched on, with the argument as generally in the same direction. The conclusions their lordships arrived at appear likely to meet with but little contradiction. At the Radnor and Knighton Meeting the question was introduced by the President of the Society, Sir George Cornewall Lewis, who, as a member of the Government, might of course be expected to advocate its adoption. The right honourable gentleman still meets the assumed objections to the measure, and they have hardly reached a more tangible form, with much ability and fairness:—

"It has been imagined by some tenant farmers that a system of agricultural statistics would lead their landlords to increase their rents, or that the Government would tax them in some new form. I hardly think that either of these deductions is a fair one to be drawn from these premises; and therefore let us look practically into the matter, and see, in the first place, what the landlord can do to increase his rent by means of agricultural statistics. When a bargain is made between landlord and tenant, each of them, I think it may be assumed, has that knowledge of the capabilities of the farm, which would be given to the public by means of agricultural statistics. I don't, therefore, see how a landlord can be much enlightened as to the productiveness of his farms by agricultural statistics. Nothing would be elicited that would lead to a desire on the part of landlords to alter their agreement with their tenants. But this does not seem to be the great fear. The real bugbear is, I am afraid, the Chancellor of the Exchequer. Now, let us see whether agricultural statistics will prevent the tenant farmer from keeping out that common enemy, the Chancellor of the Exchequer, less effectually than he does at present. What

are the taxes which fall directly on the land? Nobody, I suppose, proposes to impose a tax upon bread or on corn; I am in the habit of receiving a great many voluntary suggestions from gentlemen who conceive themselves born to discover new sources of revenue, but in all the correspondence that I have received, nobody has proposed a tax on bread, or corn, or on cattle. Well, then, of the existing taxes, there is first the land-tax. That is a fixed charge (not a fluctuating one), determined long ago, and not dependent upon present causes. The only tax that I can think of, from which the tenant farmer has need to fear the Chancellor of the Exchequer, is the income-tax. (A voice: "The malt-tax.") Well, I cannot see how the malt-tax will be affected by the return of the quantity of barley grown in the country. The malt-tax is an excise duty on the quantity of malt made. It is perfectly immaterial to the excise officer whether it is made from foreign or home-grown barley. How would the income-tax be affected by agricultural statistics? The tax is paid by the tenant, and deducted by him from his rent; it does not come out of the pocket of the party who pays it; and I cannot see that any facility can, in respect of this tax, be derived by the Government from knowing the amount of the annual produce of the soil."

A practical farmer who was amongst those who heard these arguments goes far beyond them in the force with which he expresses his own opinion. Mr. Smithies "reminded his brother farmers that these statistics would not disclose the amount of produce on each farm, but simply give the aggregate to the public. But if he were a landlord, and had a tenant who refused to give these statistics, the inference he should draw was, that it arose from a fear lest his landlord should know the amount of crops which the farm produced; and this inference would, perhaps more than anything else, lead him to the conviction that his farm was let too low. *As a British farmer, he felt himself disgraced that the experiment of collecting agricultural statistics had been attended with greater success in Scotland and Ireland than in England.*" At Kirby Moorside another practical man, Mr. Legard, concludes his speech, as chairman of the day, with the hope "that the farmers in that district would give the subject their serious consideration, believing as he did that such statistics would materially serve their interests, as they would enable them to know much better when to hold and when to sell their corn." While Lord Faversham "expressed his concurrence in the remarks made by the chairman with respect to the value of agricultural statistics, and was of opinion that any disadvantages that might attach to such a system would be fully counterbalanced by the benefits which it was capable of producing." Mr. Chowler, at Grantham, if not quite so sanguine, still thinks "that if they can be obtained they will be a benefit; but not that great benefit some people anticipate."

We have quoted enough here to show how thoroughly both the owners and occupiers of land appear to be agreed on the question. Indeed, of all the many meetings of which we have been furnished with reports, we do not remember one where any objection to the collection of these statistics has been expressed. The only condition would seem to be, that if one man is willing to supply them, all alike should be compelled to do so. At any rate, if there is anything to be urged against them, now is the time to join issue; for the Agricultural Societies of the kingdom are assuming an importance as the mouthpiece of the farmers themselves they never previously attained to. What is said and done here will be sure to have its weight elsewhere.

Though not exactly arranged as a statistical return, we shall stay our extracts for this week with a report, which hardly colours the prospects of the agriculturists so brightly as the world at large would just now picture them. Mr. Phillips says, at a meeting of the West Suffolk Society—

"The agricultural year was nearly run out, and a more trying one to the farmer he never remembered; and he dare say no one present ever remembered. They had commenced the year inauspiciously, and were ending it in the same way. It will be remembered that at our anniversay last year, we were suffering, as now, from a severe drought, which had produced very disastrous results to the root crops, and the severe winter which followed utterly annihilated them. This year we shall start worse than we did last year, because then we had the hay crop to fall back upon, and this year that is all destroyed. In addition to the loss of the turnip crop, we suffered very much in some parts of the county, from the loss of the wheat plant; and this has resulted, as it might naturally be supposed it would, in a very partial and deficient crop. The year, too, has been very disastrous to the flockmasters on the western side of the county: first, from the long and severe winter, the loss of the turnip crop, the cold and backward spring, and, lastly, from the protracted drought which now affects us, and which has put us to our wit's end to keep the flocks alive and healthy; but some, he was sorry to find, had not done even that, but, on the contrary, had sustained very heavy losses in their lambs. He did not take this retrospective view of the year so much to excite gloomy reminiscences, as to stir us up, by a wise and judicious foresight, to make provision for the coming season, which cannot be otherwise than one of great trial to farmers generally."

This, it must be borne in mind, is said with especial reference to Suffolk; but the "word in time" may be susceptible of a far more general application.

TO PRESERVE EGGS.—Pour a gallon of water upon a pound of quicklime in a jar: let it remain for about twenty-four hours to allow of its effervescence subsiding, and to be thoroughly cool. Procure the eggs as fresh as you can obtain them, and drop them gently in. Place the jar where it will be accessible to take a portion of its contents therefrom *without disturbing it*, and they will keep well for a twelvemonth.

KENNINGTON AGRICULTURAL AND CHEMICAL COLLEGE.

LECTURES ON THE GENERAL PHENOMENA OF THE EARTH, HAVING REFERENCE TO THE PRODUCTION AND MAINTENANCE OF ORGANIC LIFE.

BY CHARLES JOHNSON, ESQ., PROFESSOR OF BOTANY, GUY'S HOSPITAL.

LECTURE VI.

The fall of rain is liable to be affected by so great a variety of circumstances of which we are either ignorant or have only an imperfect acquaintance, that, beyond a few general facts in connexion with its occurrence, we cannot be said to possess much information as to the causes upon which it more immediately depends. The ordinarily cherished prognostics afforded by the rise and fall of the barometer are indicative of changes in the weight and consequent buoyancy of the atmosphere, attended by a parallel ascent or subsidence of the vapour and clouds that float in it; the latter change being probably the result of rarefaction, produced by the air becoming heated and rarefied over some particular part of the earth's surface, when the colder air of the vicinity rushing in to supply the deficiency in density, the alteration of temperature condenses the watery vapour into drops of rain; or, if very sudden in its operation, and acting upon clouds rapidly descending or occupying a low elevation, from which the condensed drops reach the earth before they have had time to acquire the heat necessary to maintain fluidity, they assume the form of hail. Such, indeed, seems to be the primary condition of the large chilling drops of a spring or summer shower, and the condensation of the same cloud that descends as snow or hail upon the hill-top or the mountain-side, may produce the plashing rain-drops of the valley below. Under other circumstances, rain-drops, passing through a highly heated, dry, and rarefied atmosphere, may by rapid evaporation become frozen, and this is probably the origin of the devastating storms of hail that occur in the South of France, as well as of those of tropical countries. The latter is conjecture: the former I have myself witnessed.

To the production of any visible fall of watery matter from the atmosphere, it seems essential that two masses of air of different temperatures should commingle, and that they should both be saturated with moisture. The absence of the latter condition over certain parts of the earth produces the excessive drought for which they are remarkable; the great African desert, for example, over portions of which rain falls so rarely as, occasionally, not to occur more than once within a period of two or three years; here the excessive dryness of the lower regions of the atmosphere enables it to absorb all the superabundant vapour wafted from the Atlantic, and thus hinder its precipitation. But though difference of temperature induced in the atmosphere by various causes is generally considered as the immediate source of condensation, there are other agents at work in the production and distribution of rain; agents whose operation, long acknowledged, is governed by laws of which we are at present only beginning to perceive the universality, as we are to speculate upon their manifestation in all of the active phenomena of nature. That electrical action is involved in, and that it may indeed be the prime cause of precipitation, is probable from the heavy fall of rain and hail that so frequently succeeds the lightning flash during a thunder storm. The fact, with which the inhabitant of every alpine district is familiar, of a cloud approaching the side of a mountain, appearing to hang over it for a time, and then separating, and resuming its previous course before the wind, offers another instance of this agency, which, so universally affecting everything around us, is still itself a mystery. How much of the diversity of climate, especially as regards moisture or dryness, may be dependent upon the electro-conducting capabilities of different rocks constituting the subsoil, or even of those underlying the latter to vast depths, is a question yet to be examined and determined.

Another form of precipitated water, of equal if not of more immediate importance to vegetation, is dew, which on some parts of our world's surface is the substitute for rain. The quantity of fluid that is deposited in this form within any given period, as during an autumn night, it would not be easy to estimate; and an ordinary observer, ready to acknowledge the swelling of the waters of a brook as due to a copious fall of rain, would probably scoff at the suggestion that such a phenomenon might be the result of this more insidious deposit, so small in amount apparently when only superficially regarded, but, under favourable circumstances, far from being incompatible with the production of such an occurrence.

The condensation of watery vapour from the atmosphere in the form of dew, is a process of a different kind from that which produces rain, and though long the subject of vague and opposite opinions, may now be regarded as ranking among the best explained of meteorological facts. It is an old, and, certainly in the main correct observation, if not originating with handed down to us by the greatest natural philosopher of antiquity, Aristotle, that dew is only deposited in calm weather and beneath a clear sky—conditions that, though not absolutely essential, are the most usual under which its production takes place. We find the solution of this fact in the well-known laws affecting the distribution of heat. All substances are capable of absorbing this medium, and likewise of radiating or sending it forth again, according to the circumstances in which they may be placed; and the rapidity with which this absorption and radiation takes place, differs greatly, being dependent upon their texture, colour, and other conditions. Some bodies and surfaces, becoming heated and cooled more quickly than others, are said to be better conductors of heat; and the production of dew is dependent upon this difference in their action. The surface of the earth heated during the day, parts with a portion of this heat by a radiation after the setting of the sun, and thus becomes colder than the air above it, a condition that causes the condensation of the watery vapour contained in the latter in minute drops. The difference of temperature between the earth and the atmosphere at this time may be

readily observed by placing a thermometer on the ground and another a few feet above it, when it will often be found to amount to many degrees. When the sky is clear the deposition of dew is more copious, because the radiated heat passes readily into the higher regions of the atmosphere, and becomes dissipated; but the presence of clouds, themselves radiating bodies on a proportionately smaller scale, resists the free passage of the terrestrial heat, and thus hinders the condensation. Some allowance must, however, be made as to the greater or less elevation of the clouds; as, when it is considerable, their counter radiation may be too distant to affect the lower strata of air in which the dew-forming process is in progress—hence, the occasional exception to the total absence of dew on a cloudy night. The fall of dew is more frequent and copious during the spring and autumn, especially in the latter, than at other periods of the year, owing to the greater difference of temperature characterizing the day and night at those seasons. A greater degree of cold than that which is necessary to condense the watery vapour may convert the dew into hoar-frost, a modification of the same phenomenon. A mist or fog, though often accompanied by a copious precipitation of moisture, must not be confounded with dew, it being a condensation of vapour arising from the coldness of the air itself, and partaking, as observed in the last lecture, of the character of the clouds of more elevated regions; indeed, the cloud, when entered during our ascent of a mountain, is only observable as an elevated mist.

The deposit of water from the atmosphere has under all of its modifications an influence independent of the wear by friction. The hardest and closest of rocks is more or less permeable by the fluid, which expands with great force under the action of frost as it becomes ice, and breaks up the surface of the stony masses thus penetrated into small particles, which succeeding thaws and rains are destined to sweep before them into the valleys and plains; while, at the same time, collecting in the crevices and fissures of the mountains in larger quantities, the same expansive agency enables it to rend and dislocate in masses the firmest of the vitrified and crystalline substances composing our earth's crust, to be successively undermined, hurled down, and shattered by the coming torrent, and thus add to the complication of the multiplied processes under which soil is formed and renovated.

Connected with all of the foregoing phenomena, and with changes of temperature that occasion them, are the movements to which our atmosphere is subjected from a variety of causes. As a fluid, surrounding a globe in constant and rapid rotation upon its axis, it might be supposed to be somewhat similarly circumstanced with the ocean, as regards a tendency, originating in the centrifugal force generated by that rotation, to flow from the poles towards the equator and produce opposing currents there, resulting in the north-east and south-east trade-winds, which, as well as the prevalent south-westerly winds of Western Europe, were originally thus accounted for. But several circumstances interfere to negative, or at least to so modify such an effect that it may be regarded as of small account in our estimation of the origin of those winds even that are the most invariable in their direction. The different character of an aëriform fluid renders it liable to disturbances that would scarcely affect the ocean as a mass of water. Less cohesive and highly elastic, the air expands and contracts readily under the alternate influences of heat and cold; and consequently the atmosphere exists under very different conditions over different portions of our varied globe, according to the temperature of the parts it covers, being light where subjected to the influence of equatorial or tropical warmth, heavier over the cold regions of the poles; and as the mean difference of the temperature between the two amounts probably to eighty or ninety degrees on our thermometer, the difference of atmospheric density is very considerable. As a fluid, there is a tendency to neutralize this difference—to restore the equilibrium. The heavy cold air presses against the warm and lighter, and buoys it upwards; hence there is constantly a current of warm air ascending from the meridional parts of the earth, and as constantly a heavy cold current sweeping below towards the equator to occupy its place. These currents come immediately from north and south; but like the polar currents of the arctic and antarctic seas, they are interrupted in their direct courses by friction against the earth itself, as they pass successively from parts of its rotating sphere in comparatively slow motion, to others moving with a continually increasing velocity—a circumstance that will be readily understood by remembering that the diurnal rotation of a circle of a mile in circumference around either pole, and that of one of twenty-four thousand miles at the equator, is necessarily performed within the same period of twenty-four hours; the motion of the former is so slow that it might be regarded as a state of rest compared with that of the latter, which is a thousand miles per hour. As the earth revolves from west to east, and the inertia of the air prevents it from immediately acquiring the increasing rapidity of those parts of the surface over which it successively arrives, it appears to meet us inclining from the east, the opposite direction to that in which the earth is carrying us, producing a wind similar to that experienced by a person riding rapidly upon a calm day. By the time the northern descending current reaches within a few degrees of the tropic, it thus becomes converted into a north-east wind, as that proceeding from the south pole becomes changed to one from the south-east, constituting the so-called trade-winds that prevail to about 28 degrees north and south of the equator.

The true sources of the change in the direction of the winds are yet unknown, or but very imperfectly understood; but these primary currents of our atmosphere are liable to modification and often apparent inversion, in consequence of the local peculiarities of the surface over which they traverse, which surface, were it uniform, might insure the prevalence of a north-easterly wind on one side of the equator and of a south-easterly on the opposite. Irregular however as it is—here rising into chains and groups of mountains covered with ice and snow, there extending in low plains, sometimes covered with vegetation, elsewhere parched and barren, while a larger portion is occupied by water—it presents so great a diversity of heat radiation as to create much disturbance and that variability for which in most countries the wind has become proverbial. The changes of season and of day and night, and the attraction of the sun and moon, are among other sources of agitation in the general mass of air; but unequal radiation is probably the prime agent, involving as it does electric and magnetic phenomena that render the subject of the winds one of the most complicated of human inquiry.

To the north and south of the tropics, beyond the limits of the trade winds, or between the 30th and 60th degrees of latitude, currents of a less constant but still prevailing character are met with, having an opposite direction, that is, from south-west in the northern hemisphere, and from north-west in

the southern; blowing, indeed, from the equator towards the poles, with an inclination from the west which becomes greater with the increase in latitude. The cause of these winds is not positively ascertained, but from the observed movements of the clouds in the vicinity of the tropics, and other corresponding circumstances, they are considered to arise from the opposition of the north-east and south-east trade-winds, resulting in a returning current towards either pole, which current is in general sufficiently powerful to overcome the descending polar current, and occupy at times its place near the earth's surface. In the northern hemisphere, the prevalence of south-westerly winds has been long a subject of remark; and their influence in rendering the sailing passage from New York to Liverpool shorter by nearly half the number of days than that in the opposite direction is a well-known fact.

The westerly inclination of a south wind in our hemisphere is a necessary consequence of its rotary motion being greater than that of the places over which it passes successively during its progress northward, in the same manner as the easterly inclination of a north wind is the effect of that motion being slower, as previously stated. Hence it is owing to the earth's rotation on its axis that we so rarely have the wind in these parts either due north or due south.

The prevalence of south-westerly winds is of vast importance to us, not only in consequence of their correspondence with the course of the Gulf-stream in contributing to the comparative mildness of the climate of Western Europe, as referred to in our second lecture, but from their reaching our shores only after a long passage over the Atlantic, during which they become loaded with vapour. Hence, indeed, the abundance and frequency of rain in the western parts of our island, as well as that peculiarly verdant aspect of Great Britain and Ireland, generally so striking to our continental neighbours, from its contrast with that of many inland parts of Europe. The average of southerly and westerly winds throughout the year at London is 233 days, leaving only 132 days during which northerly and easterly prevail.

The conflicts between the primary currents of the atmosphere, during which they alternately yield to and prevail against each other, and interruptions to them produced by other causes, are generally attended by storms and tempests. This is especially exhibited in the Indian Ocean and the countries bordering upon it, where the north-east trade-wind is interrupted by a periodical wind, called the south-west monsoon, or season-wind, which, occasioned by the rarefaction of the atmosphere over the continent of Asia, while the sun is north of the equator, prevails from April to October, or between the vernal and autumnal equinoxes; the trade-wind, here called the north-east monsoon, prevailing during the other half of the year, while the sun is to the south of the line. The effect produced by the setting in of the monsoon is most graphically described by Mr. Elphinstone, in his account of Caubul. "The most remarkable rainy season is that called in India the south-west monsoon. It extends from Africa to the Malayan peninsula, and deluges all the intermediate countries, within certain lines of latitude, for four months in the year. Its approach is announced by vast masses of clouds, that rise from the Indian Ocean, and advance towards the north-east, gathering and thickening as they approach the land. After some threatening days, the sky assumes a troubled appearance in the evenings, and the monsoon, in general, sets in during the night. It is attended by such a thunder-storm as can scarcely be imagined by those who have only seen that phenomenon in a temperate climate. It generally begins with violent blasts of wind, which are succeeded by floods of rain. For some hours lightning is seen almost without intermission; sometimes it only illumines the sky, and shows the clouds near the horizon; at other times it discovers the distant hills, and again leaves all in darkness, when, in an instant, it reappears in vivid and successive flashes, and exhibits the nearest objects in the brightness of day. During all this time the distant thunder never ceases to roll, and is only silenced by some nearer peal, which bursts upon the ear with such a sudden and tremendous crash as can scarcely fail to strike the most insensible heart with awe. (Malabar is the province the most distinguished for the violence of the monsoon.) At length the thunder ceases, and nothing is heard but the continued pouring of the rain and the rushing of the rising streams. The next day presents a gloomy spectacle: the rain still descends in torrents, and scarcely allows a view of the blackened fields; the rivers are swollen and discoloured, and sweep down along with them the hedges, the huts, and the remains of the cultivation which was carried on during the dry season in their beds.

"This lasts for some days, after which the sky clears, and discovers the face of nature changed, as if by enchantment. Before the storm the fields were parched up, and except in the beds of the rivers, scarce a blade of vegetation was to be seen. The clearness of the sky was not interrupted by a single cloud, but the atmosphere was loaded with dust: a parching wind blew, like a blast from a furnace, and heated wood, iron, and every solid material, even in the shade, and immediately before the monsoon this wind had been succeeded by still more sultry calms. But when the first violence of the monsoon is over, the whole earth is covered with a sudden but luxuriant vegetation; the rivers are full and tranquil; the air pure and delicious; and the sky is varied and embellished with clouds. The effect of this change is visible on all the animal creation, and can only be imagined in Europe by supposing the depth of a dreary winter to start at once into all the freshness and brilliancy of spring. From that time the rain falls at intervals for about a month, then comes on again with great violence, and in July the rains are at their height; during the following month they rather diminish, but are still heavy, and in September they gradually abate, and are often suspended until near the end of the month, when they depart amid thunder and tempests as they commenced."

The value, in these hot countries, of storms, always fearful in character, often largely destructive of human life and labours, can only be estimated in its full extent by reference to their peculiar climatic conditions and the necessities of organic existence involved by them—topics which we cannot here discuss. Let it suffice for the present to regard them as examples of physical causes operating to the disturbance of our atmosphere. The interruption of the primary current, upon which the changes of the monsoons are dependent, appears to be entirely due to the great radiation of solar heat from the continent and islands that give to the Indian Ocean much of the character of an inland sea. Owing to the absence of land to the south of the equator, no such marked interruption is experienced, and the south-east trade-wind prevails throughout the year; subject, however, to periodical tempests of great violence, that probably originate in the unequal radiation between the unlimited expanse of water extending

southward and the African and Australian continents on either side.

Similar changes in the density of the atmosphere, acting more locally, would appear to be the immediate sources of those devastating storms that occur so frequently at certain seasons in other parts of the world. The rarefaction of the air over any particular spot of the earth's surface is necessarily followed by an influx of that which is heavier from the surrounding parts, occasioning a whirling movement—such as is often seen on a hot summer's day, lifting the dust and other light materials in circular or spiral eddies, that shift over the landscape with greater or less rapidity, moving forward in the direction of the prevailing current—a miniature whirlwind, but imaging on a small scale the mightier effects of the hurricane and the tornado, though wanting those tempestuous accompaniments that more powerful disturbance of our airy envelope calls into action.

The unity of cause upon which the variations of the wind are immediately dependent, whatever may be the influences with which it co-operates, is further exhibited in the alternation of the sea and land breezes which prevail in most of the warmer and especially tropical countries near the sea-coast, and contribute greatly to the amelioration of climate. On such coasts, in settled weather, the sea-breeze sets in, an hour or two after day-dreak, at first blowing gently, but gradually increasing in strength as the sun advances towards the meridian, prevailing throughout the day, but gradually declining towards six in the evening into a calm, lasting for about two hours; this is succeeded, in many instances, by a fainter and less continued breeze, blowing from the land, that continues during the night, fading again into a calm towards the morning, when the sea-breeze again begins to become manifest. In this case, the unequal heating of the land and water by the action of the sun is the cause, as it is of the monsoon change. The air becomes rarefied over the land, and rises; while the denser air from the sea flows in below to supply its place: so long as the heating influence of the sun lasts during the day this influx continues, and, over a level country or a small island, as the night approaches, the density of the atmosphere soon acquires its equilibrium; but, where the interior of the land is of considerable elevation, as the sea-breeze declines, owing to the temperature over the coast and the ocean becoming thus equalized, the colder air of the mountains begins to descend, and a land breeze is the consequence—this latter depending therefore on local circumstances is less constant in its action than the former, and it never extends far from the coast. The effect produced by this continued interchange of air currents is of considerable importance to the inhabitants of tropical coasts and islands, and it may generally be considered that their more or less healthful condition is greatly influenced by the constancy of its action.

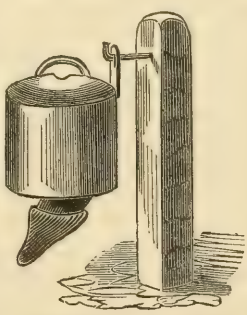
The hot damp wind, the plague of Southern Europe, dispensing languor and ill-humour wherever it reaches, and the subject of anathema and proverb with all who experience its enervating power, originates in the high rarefaction of the atmosphere over the deserts of Arabia and Africa. Heated and dried by its passage over these, it becomes loaded with imperfectly commingled vapour during its transit across the Mediterranean; whence the peculiar haze by which it is generally accompanied, obscuring the sun, and changing the deep unstained azure of a southern sky to the gloom of a northern. This "sirocco" of Italy and "solano" of Spain has its parallels elsewhere, dependent upon similar causes, and equally dreaded by the inhabitants of the lands they traverse. But though frequently prejudicial when considered only in regard to their local effects, all of these modifications of the aërial currents are instrumental to the maintenance of the vast atmospheric medium in that state of constantly recurring change and renovation which appears to be the necessary concomitant of organic being, as it is observable in all the provisions that are subservient to its existence: stillness and death are synonymous conditions in Nature—activity and life are not less essentially connected. The diseases physical and moral (and they are of both classes) that accrue from the want of ventilation within confined spaces are only of the same character with those which a stagnant condition of the atmosphere at large must inevitably induce, and the dread of draughts and rheumatism in the effort to replace foul-air with pure, in a close apartment, is but the equivalent to that of the thunder-tempest and the whirlwind in the ventilation of the globe. In estimating the untoward results of either, we are apt to overlook the fact that

——"the Universal Cause
Acts not by partial, but by general laws;"

and, what is of more importance to us, to forget that our powers, as yet unlimited in their progress, were bestowed upon us, in order that we might, by observation and the exercise of reason, obviate or avoid those evils in natural agency, that only become such, when we, by want of foresight or neglect of known material laws, expose ourselves to the consequences of their stern and invariable action. Were we to dwell in a world in which evil did not exist, where accident could not befal, the course of human improvement must cease, the excitement so necessary to advance must fail, and apathy and listlessness assume the place of progress. As it is, all of the great destructive phenomena of Nature work in every way for the ultimate benefit of mankind; not only in the maintenance of the mighty law of change and renovation, but as so many incentives to the exertion of human genius to overcome or to avoid.

CALF SUCKLER.

The accompanying cut represents an implement for suckling calves, which was exhibited and attracted much attention at the Pennsylvania State Fair. It appears to be a good invention, well calculated to facilitate the feeding of calves after taking them from the cow. It is simply a tin vessel, holding a few quarts of milk, with a gutta percha teat secured over the rim of the tub beneath. This teat has in it a valve, through which the fluid within is drawn out by a slight pressure similar to that of the calf's jaws, or of the hand in milking. It also has a handle by which to suspend to a hook in the stable or yard, so that the calf may go to it at pleasure. It seems to us that this simple calf suckler may be found highly useful and convenient, and save much of the time and the trouble required for feeding in the ordinary way. The slower process also of drawing out the milk in the natural way by suction, rather than to drink it by mouthfuls, mixes it better with the saliva, and produces more benefit.—American Farm Journal.



FRENCH HUSBANDRY.

L'OISE.—NORMANDY.

The more we wander through the rural districts of France, the more we are impressed with the intelligence and industry of the French peasantry. It is true that where the land is very light, or where it is wet and wants draining, the corn crops are poor and thin; for, in the first case, the land does not obtain that assistance in the way of manure which is necessary to render poor light soils productive; and in the latter, no effectual means of removing superfluous moisture appears to be known, or at least to be within the reach of the French occupier. But where the land is naturally good, careful tillage without much manure produces very large crops of grain. Thus, from Bresle (on the road from Clermont) to Beauvais (Department L'Oise), the road lies through a beautiful undulating country, now bearing very heavy crops of wheat, oats, and barley. Judging from their appearance, the wheat must yield below 40 bushels to the acre, and the other grain in proportion. Here, 12 or 14 miles, the land is a good loam on an open subsoil; there is no great breadth of grain crop, and scarcely any cattle or sheep are to be seen in the fields. A good deal of land is appropriated to the vine, which at this season looks remarkably well. Oxen here appear to do much of the farm and road work; they are very large dun and fawn-coloured animals, such as we see imported from Spain, and sold in Smithfield market. They draw from the head, and, except a padded bar across the forehead, to the end of which the traces are attached, they have no harness whatever, and appear to do their work with great ease to themselves. Their pace is slow; but that is in accordance with everything in France, where nobody or anything moves with much rapidity. One can't help regretting that of the fine grain crops referred to, so large a proportion will certainly be wasted by shedding, for the means of the different occupiers being wholly inadequate to get in their corn before it has become greatly overripe, and there being no (or little) extra hired labour, the loss always sustained from this cause is estimated to amount to more than sufficient to seed the ground for the succeeding year. A wood (de Soligny), through which the road from Clermont to Bresle passes, is of great extent, and appears to be most admirably managed. It is Government property.

A subsequent journey from Paris to Dieppe and back was still more interesting than that above referred to, from the great variety of the scenery, as well as of the crops, and uses to which the land is applied, though the wheat crops are by no means good. This road (the railroad) runs for the most part along the valley of the Seine, and when we reach Normandy, we are reminded of our English scenery. The permanent pastures are extensive and good, and the fields are generally bounded by hedgerows. The fences, however, do not seem to be wholly relied on, for nearly every pasture field has a fold in the middle, made of high wooden hurdles—such as are sometimes used in deer parks in England—and which are moveable, into which the cattle are driven at night. The whole of this district, through a distance of upwards of 100 miles, is famous for dairy husbandry, and the cows are, we think, the finest for exclusive dairy purposes we ever recollect to have seen. They are large animals of various colours, but chiefly red-and-white, yellow-and-white, and brindled. They are also of great substance, and in the hands of an English breeder of shorthorns, might easily be moulded—and that without crossing—into a fine race of meat-producing cattle. The demand for really fat meat in France is, however, so very limited, that there is probably little inducement to French agriculturists to make much effort in the direction of beef producing. That we might avail ourselves of the Normandy breed for our own dairies, is a matter which should receive the attention of our breeders. The price is about the same as our own full-sized milch cows. A good two-year-old heifer, about which we made some inquiry with a view to purchase, but had not time to look at, was to be sold for between £14 and £15; and we propose to import one of the breed for the purpose of crossing with the shorthorn. Indeed, in so many points the Normandy cow has some similarity to the shorthorn, and is an animal of such good form and substance, that we anticipate some very valuable animals may result from the cross. The French cover the feet of their horses more than we do, and with much advantage, for undoubtedly our road-going horses have their shoes made too narrow. An intended journey to Lyons and Grenoble will afford the opportunity of noting a few of the diversities of French husbandry which the passing traveller may read.—"Economist."

"LA TANGUE."

Our readers must not be astonished at the word which forms the heading of this article. They will not, we believe, find it in any ordinary French dictionary; but the article which it represents appears to be of such great importance in an agricultural point of view in the district where it is found, and opens for us so many collateral snbjects of consideration, that we need not, we concieve, apologize for thus abruptly introducing it to the notice of our readers, premising, as we well may, that no mention has hitherto been made of it in any part of our existing agricultural periodical literature.

What, then, is "La Tangue"? It is the name given by Breton agriculturists to a species of peculiarly fine sand which is borne by the sea at every tide into the bay of Mount St. Michael, on the coast of Brittany. The fertilising principles of this sand, and its use as a manure, have been discovered rather by accident than by any regular course of reasoning; and although success did not uniformly attend the first application of it to the soil, still the results of many trials of it were such as soon to establish its reputation on a firm basis. Originally, it seems to have been applied only to grain crops, to the production of which, in fact, the agriculture of Brittany seems originally to have been limited; and the extraordinary success of this application, seen both in the quality and abundance of the crops obtained by it, was so great, as to considerably extend its use; so much so, that now one of the features of the districts of Avranches and Pontorson is the immense number of carts and wagons which fill all the roads leading to the places where this precious fertilizer is found.

We will give the general results of two experiments, which tend greatly to prove the truth of what we have advanced:—

Half a piece of ground, of the same quality throughout, of 48 *ares* in extent (a French *are* being about a tenth part of an English rood; that is, about a fortieth part of an English acre, or rather less), received a good double dunging of farm-yard manure; that is, one cubic *mètre* to every two *ares*, a *mètre* being the fundamental unit of French weights and measures, and being rather more than an English yard—about a yard and one-ninth of a yard. The rest of the ground, the other twenty-four *ares*, received five hectolitres of "La Tangue," a hectolitre being a little more than twenty-two gallons—or two bushels six gallons. The whole piece was planted with potatoes on the same day; during the first two months of vegetation, little difference was observed; towards the end of June, the haulms of the potatoes manured with "La Tangue" became extremely large, and of a very deep colour, and when dug (in September) the crop was *more than double* that produced by the dung, and was remarkable as well for the size of individual tubers as for the general abundance of the crop. Some tubers weighed 1 kilogramme 500 grammes, that is, between two and three lbs. The experiment did not end here: the ground was harrowed down to level it, and sown with "colza" or rape. The colza plants on the portion manured with "La Tangue" were 30 centimètres high, while those on the other portion were but 17. (A centimètre is the hundreth part of a mètre.) We have given the French terms of weight and measure, as, owing to fractional parts, it is difficult to render their exact equivalent in English.

Another experiment was tried on a piece of ground of lighter and more porous texture than the foregoing, of about forty ares; to this, which was afterwards sown with red wheat, a mixture of 5 hectolitres of "La Tangue," with 5 cubic mètres of farm-yard dung, was applied. On being mixed, previously to application, it fermented violently, so as rapidly to diminish the volume of the heap by nearly one-half. The result was a crop of wheat heretofore unheard of.

These details, taken from a letter in the "Revue des Deux Mondes," dated Nantes, April, 1855, by the Inspector of Agriculture of the Departments of the Loire Inferieure, will explain pretty well what are the claims of this species of sea-sand, found on a part of the coasts of Brittany, to its high character as a fertilizer. No precise quantitative analysis is given us of its composition, but we are given to understand that it consists of lime, pure sand, and salt; that these contain lime, carbon, silicic acid, and nitrogen; and it is rightly argued by the Inspector, that, since all plants, whatever the soil in which they grow, require the above constituents to bring them to maturity, and as these constituents are undoubtedly furnished by "La Tangue," this manure is therefore suitable, not merely to the soils in the immediate neighbourhood of which it is found, but to all soils whatsoever.

The writer proceeds to speak of the great weakness of French agriculture, namely—a want of sufficient manure at a cheap rate; and argues that this want may be supplied by a judicious and duly economical application of "La Tangue."

We have heard ere now from other sources of a fertilizing sea-sand, found chiefly at the mouths of

the river Morlaix, a spot separated by perhaps 120 or 130 miles of coast from Avranches and Pontorson; these places forming the deepest part of the spacious bay which incloses the Channel Islands in its span, while Morlaix is situated nearer the extremity of the southern coast of it, this being the coast of that portion of Brittany which, from its projecting so deeply into the sea, was called by geographers "*La proue de l'ancien monde.*"

We know no particulars about this sand found at Morlaix beyond the fact that it is extensively used, though in rather larger quantities in proportion to the extent of land than "La Tangue" appears to be. It is supposed to consist principally of the remains of shells, madrepores, and corallines, together with a small proportion of highly azotised organic matter. It is obtained by dredging from barges, and is said to be re-produced from time to time by a constant series of new banks. A shell sand of probably similar composition abounds on the coasts of Devon and Cornwall, and has for many generations been used by the neighbouring farmers. Originally, it was borne into the interior on horses' back; now it is transported in larger quantities and to greater distances by railway. It is used, by preference, as soon as possible after it is carted away, on account of the sea-water pervading it, which adds to its value, but evaporates rapidly. We subjoin an analysis, which we have from good authority:—

Water	0.500
Soluble salts	0.300
Organic matter	2.420
Carbonate of lime	47.438
Carbonate of magnesia	0.097
Sulphate of lime	a minute trace
Phosphate of lime	0.025
Oxide of iron, alumina	0.460
Sand, silica, and debris of slaty and granitic rocks	48.760
	100.000

Sand of apparently the same description has been used by the farmers of the north-east coast of Norfolk, and is applied chiefly to the heavy clays, on which it is believed to exercise a very good effect; the same is the case on parts of the coasts of Ireland, Scotland, and the Hebrides. Nor is this the only way in which the produce of the sea is used to fertilize the land; under the name of "sea-ware," great quantities of the cryptogamic plants, of the order "fuci," are used as manure, and with considerable success, on the Scottish coast, between the Forth and Tweed, and also on the coast of Northumberland. They are occasionally applied unmixed; at other times they are formed into a compost by mixing them with soil or farm-yard dung; and also are used for littering cattle, and so forming manure when straw is scarce. Of this nature, also, is the "varec" or "vraick" of Jersey and Guernsey.

We are persuaded that "La Tangue," in common with these other marine fertilizers, owes, like them, a great portion of its value to its origin. In the absence of more decided details as to its composition, we cannot determine how far it would be likely to pay for transportation, but we consider the particulars obtained from the intelligent article in the "Revue des Deux Mondes" sufficiently interesting to be laid before English readers, who may occasionally be tempted to forget that aspirations after agricultural improvements are felt in other countries than their own, and eagerly sought after, as constituting, not merely agricultural, but national improvement.—"Oxford Journal."

IRISH AGRICULTURAL STATISTICS.

TOTAL QUANTITY OF LIVE STOCK IN IRELAND, in each of the Years 1852, 1853, 1854, and 1855:—

	No. of Horses.	No. of Cattle.	No. of Sheep.	No. of Pigs.
1852	525,088	3,095,067	2,613,943	1,072,658
1853	539,785	3,383,309	3,142,656	1,144,945
1854	545,929	3,497,901	3,722,219	1,342,549
1855	555,536	3,556,616	3,598,471	1,174,224
Increase in numbers from 1852 to 1855	30,448	461,549	984,528	101,566

TOTAL VALUE OF LIVE STOCK IN IRELAND, in each of the Years 1852, 1853, 1854, and 1855, calculated according to the Rates assumed by the Census Commissioners of 1841, viz., for Horses, £8 each; Cattle, £6 10s.; Sheep, 22s.; and Pigs, 25s. each:—

	Horses.	Cattle.	Sheep.	Pigs.	Total.
	£	£	£	£	£
1852	4,200,704	20,117,935	2,875,337	1,340,823	28,534,799
1853	4,318,280	21,991,509	3,456,922	1,431,181	31,197,892
1854	4,367,432	22,736,357	4,094,441	1,678,186	32,876,416
1855	4,444,288	23,118,004	3,958,318	1,467,780	32,988,390
Increase in value from 1852 to '55	248,584	3,000,069	1,082,981	126,957	4,458,591

The returns from which the foregoing tables were compiled have been collected, as in former years, by the efficient aid of the Constabulary and Metropolitan Police. Tables for 1855, classified by holdings, for each barony and county, are now in course of preparation.

WILLIAM DONNELLY, Registrar-General.

EXPOSITION UNIVERSELLE DE L'INDUSTRIE.

[FROM THE FRENCH OF MONS. VICTOR BORIE, IN THE "JOURNAL D'AGRICULTURE PRATIQUE."]

CHAP. I.—CHAOS.

The Palace de l'Exposition Universelle, the entry to which had been reserved for fifteen days to season ticket holders and such as chose to pay five francs, has been thrown open to the public since the first of June, on terms to which the Executive pledges itself to adhere as long as the Exposition lasts. We must nevertheless acknowledge that hitherto, notwithstanding the large reduction in the admission price, the interest which it has excited has by no means realized the hopes which had been very reasonably founded on the attractions of so magnificent a spectacle. The cause of such a lack of enthusiasm on the part of the public admits of a very simple explanation. In spite of the incessant exertions of the Executive and the exhibitors, the arrangements are as yet far from complete. Even in some of the most important departments they are very much behind-hand.

Nothwithstanding these drawbacks, the ground-floor of the Palace presents already a very satisfactory appearance. The leading compartments are not yet finished, and the small counters in the gallery are not all occupied; but the leading stalls of drapery, silks, porcelain, crystals, arms, plate, bronze, &c. are quite complete.

Little by little, Agriculture has been banished from our Crystal Palace. It has had a large space reserved for it in the *Annexe* of the Conference Quay, and to-day it is seriously menaced with expulsion from thence, for the purpose of being banished to the great shed near the Panorama.

The Agricultural Machines, which were at first established in the *Annexe*, are already removed, and placed under the shed of which we have spoken. As regards the machines, we have nothing to say against this arrangement: they will be better there than anywhere else. The case is, however, widely different with the agricultural productions, which are partly installed in the higher galleries of the *Annexe*, and which it is also proposed to displace. One vast shed, covered in with tarpaulings, such as they have just constructed, is very suitable for sheltering the ploughs, harrows, and the sowing and threshing machines, &c., as well as the locomotives which are to set them in motion; but is there not great reason to fear that the agricultural products will lose much of their interest by being banished far away from the other industrial products which are nearly related to them, such as nutritious products and chemical substances? In fact, they have marshalled their machines, but have as yet not laid a finger on the products.

The Crystal Palace is alone open to the public; hence the agriculturists, who have no direct interest in general industry, will find nothing to their taste in the Exposition, before the opening of the gallery, which has been built by the side of the water and its environs, where the agricultural products and machines once more keep company.

We have been permitted to penetrate this reserved part, and are now about to take a rapid *coup d'œil;* a bird's-eye *resumé*, in fact, of all we have seen. Our readers must understand that as nothing has as yet been classed, both products and machines have flitted confusedly before our eyes, and that the recollections which we are anxious to fix here must be almost as fleeting as a first impression.

At the outset we were struck with the rapidity with which the English part of the agricultural exhibition has been got up: all was topsy-turvy in every region, except where England displays her brilliant machines, all glistening and marshalled in battle array.

We remarked in the English part of the Exposition some new and very interesting machines; but we have also met with some old acquaintances there—machines which have been described in the *Journal d'Agriculture*, and the designs of which it has published. For instance, Mr. H. Clayton's vertical machine for making drainage-tiles; Mr. Whitehead's horizontal steam machine, for the same purpose; Ball's threshing machine; Shanks's mowing machine; all of which have already formed the subject of special articles in our journal.

A machine of Clayton's has also attracted our notice, which can be employed both for making bricks and drainage-tiles, and which has the advantage of simultaneously screening the clay; a machine by the same maker which serves to break up (or "pug") the clay; a threshing machine from the same; two other threshing machines—one from Garrett and Son, and the other from Hornsby and Sons; M'Cormick's reaping machine, manufactured by Burgess and Key; Bell's reaping machine; several carts, which have been described by Mons. Moll in the late numbers of this journal, and which have had their designs given in it as well; a Crosskill roller; two threshing machines, one from Stanley, and the other from Barrett's; as well as harrows and hay-making machines.

It is impossible to say much of the other nations, as their machines are so scattered; some of them being still in pieces, while others are carefully packed up. Taking ploughs alone, we saw such a regular *mêlée* of them under the shed devoted to agriculture, that it would have been next to impossible to meddle with them before at least a fortnight's labour had communicated some spirit of order to the bosoms of these peaceful implements.

The locomotives will be very numerous. England has two of them, selected from the foundries of Howard; while Calla, Lotz, and Nepveu have sent three to re-

present France. These locomotives will have their steam kept up as long as the Exposition lasts; and it will be their duty to set in motion the machines which are to work in the presence of visitors.

The high price which alcohols have reached during the last two years assigns to the making and distillation of sugar of beetroot a very important place. One also remarks among the machines exhibited a large number of distilling apparatuses. Cail, of Brussels, has sent an apparatus of simple construction for the making of sugar; Heckmann, of Berlin, has exhibited an apparatus for the same object. We have also a cylindrical condenser from De Mulder, of Nivelles, in Belgium; a large apparatus of Schuzenback's, for crushing beetroot, made by Cail and Co., of Paris; an immense copper distillery apparatus from the same maker; and another, on Leplay's system, from Hurtrel and Co., of Moulins, Lille (North). Lastly, Ibry (Claude), a proprietor at Grenelle, near Paris, has exhibited a small machine, with a label inscribed word for word as follows:—"*Distilling apparatus, which can be adapted to the distillation of all kinds of spirits, and which extracts spirit from beetroot of* 95 *to* 96 *degrees proof.*"

The agricultural products are almost all placed in the higher galleries of the grand *Annexe*.

England has not yet finished this part of her exhibition. We have only been able to find four or five glass cases, where they exhibit hams and cheeses of a size which we dare not even dream of in France. These cheeses, of the celebrated house of Dean and Son, come from the different counties of England; and their form and size vary according to the county. They are sent from Leicestershire, Wiltshire, Somersetshire, Cheshire, and Yorkshire. The English wools we have not yet seen.

Already France has some glass cases fully arranged. We need hardly say that in this line Monsieur Vilmorin is the *facile princeps* of the Exposition. He has set out with the most exquisite taste three compartments; two for roots, while the middle one is exclusively devoted to tubes filled with seeds. The simplicity of the arrangement, and the high quality of the products, make this exhibition a very remarkable one.

The sheep-fold of Gevrolles has filled its allotted glass case with wools worthy to sustain the high reputation of this establishment. Raibaud-Lange has sent the products of the south, the classification of which is not quite finished yet.

There is every appearance of the wool-show being a very well stocked one, if we may judge from the extent of empty space on the wall, where we find this inscription "FLEECES."

The products of Algeria are strongly packed up in their massive cases. Up to this time one can see nothing more of them than the label which marks the place which they are destined to occupy. In fact, in the galleries of the *Annexe* one encounters at every step some sealed cases, with "Agricultural Products" inscribed on them. These cases come from every corner of Europe. Let us hope that they will be opened some day, and at last allow the public to gaze on the treasures which they enclose.

The nutritious products enter quite naturally into the catalogue of agricultural products: albeit they have been separated. Although agriculture does not produce food all ready for consumption, it at least furnishes the primary matter. We are assured that we shall see perfect marvels in this class of products, but that nothing has as yet been unpacked. The public is fortunate in not being admitted to the *Annexe* in the state it is to-day. Nothing is so irritating as the sight of these mute cases, which annoy you with their attractive labels, and seem to be anxious to guard for themselves alone the treasures which they are supposed to contain.

We will conclude by pointing our readers' attention to a *thing* (we can find no other word) which we met with in a corner of the English part of the agricultural exhibition. Is it a machine? Is it a simple agricultural product? Is it a chemical substance? We are most seriously embarrassed in attempting to classify this object. The superscription, which is translated into French and English, and graven in letters of gold on a magnificent iron plate, will instruct our readers better than we can ourselves. Subjoined is the literal French inscription:—"*Thomas Bigg's improved apparatus for using his celebrated composition for dipping sheep and lambs. His specific lotion for the scab furnishes a complete remedy for this at once ruinous and hateful malady.*"

Chap. II.—English Agricultural Machines.

In the rapid review which we made a fortnight ago of the works of the principal exhibitors we omitted many names, and overlooked many instruments of interest; hence we proceed to repair some of these omissions. We were not, however, able to traverse the agricultural department of the Exposition very methodically, on account of the disorder which still existed in it. We have begun to-day to see a little more clearly amongst these countless battalions of instruments, and have found again some objects to which we are anxious to direct attention before dwelling on them more at large. Mons. Lefèvre (Pierre), from Vendhuille, near Lechâtelet (Aisne), has exhibited a drill with horizontal and moveable cylinders. The cups measure the quantity of grain required for the sowing, and a set of them is affixed to each machine. In rocky soils the jolts cause the grains to jump away from the cylinders, and it is with a view of avoiding this inconvenience that M. Lefèvre has contrived to make them turn round a concentric funnel destined to receive the grains which escape.

A physician of Calvados, one M. Penn-Hellouin, has invented a churn which has, according to him, the property of stirring the globules of cream with such energy as to separate the butter from the milk in three minutes and a half.

M. Letessier (or Pays), from Laval (Mayenne), exhibits a roller to smooth the earth after sowing; while M. Decrombecque, of Lens (Pas de Calais), exhibits a harrow with moveable teeth, which they use with the greatest success in Flanders for land cleaning. M. Dumont, of Juvisy, also exhibits a jointed roller in cast-

iron, made in four separate parts. This instrument rolls very easily, and is employed to the greatest advantage. We can only find one fault with it, which is, that it makes noise enough to frighten the horses which are not accustomed to it. M. Fondeur, jun., of Jussy (Aisne), has exhibited a double Brabant plough, of which they speak most highly. We have observed two other similar ploughs, without being able to ascertain their exhibitors. M. Devroede, of Vouziers (Ardennes), has a leveller, or frame-harrow, constructed with a simplicity which quite predisposes one in its favour.

We must also mention a turf-cutter of M. Quentin Durand, of Paris; a hoe and a drill of M. Claes, of Lembec (Belgium); a turn-wrest plough, one of the best instruments which the workshops of Grignon ever sent out; and lastly, a root-cutter of M. Moufflet, of Orleans, which can chop sixteen bushels of roots* for cattle-feeding, and cut at the same time an equal quantity of fodder by means of surplus steam.

We will end this enumeration with an excellent subsoil plough or moveable hoe of Mons. M. G. Hamoir, of Saultain, and a scarifier, whose teeth can be raised or depressed at pleasure by means of a simple and solid piece of mechanism; nevertheless the whole row of teeth are elevated or depressed at one time, and it is to be regretted that M. Hamoir has not found the means of making each tooth moveable and independent of the others. It would also be desirable that the frames should not be made in one piece, as in case of accident the re-adjustment becomes difficult.

Among the agricultural products which are placed under the extended shed allotted to machines, we remarked the show made by M. Gerard; it includes roots of remarkable beauty for feeding beasts, and we may mention the red round beetroot, the yellow globe beetroot, the German beetroot, the common beetroot, the red carrot, and the white green-topped carrot; the turnips or radish of Limousin, the radish of Auvergne, the swede, and the kohl-rabi. Among these magnificent samples we also find the saccharine beetroot, or the white beetroot of Silesia.

The different juries of the agricultural class have already met several times. It appears that even their different tasks of inspection have been allotted. In the machine section it has been decided to apply to the Executive of the Palace to take the necessary measures to test the new instruments in a field. This is an excellent idea; for there is not, we should say, a better means, and, in fact, it is the only means of informing ourselves of the real value of the machines and instruments exhibited.

We must, however, leave for a time the shed reserved for French, Belgian, and German agriculture, where the Executive are busy with their final arrangements, to penetrate into the Annexe, and make our first observations upon the English instruments, which are now perfectly in order. The Busby cart, which is exhibited in the Annexe, has obtained several of the English Royal Agricultural Society's prizes, and has been mentioned among the machines which won Mr. Busby the great medal at the Exhibition of 1851. Subjoined is the description which our fellow-editor, Mons. Moll, has made of it, in his remarkable work upon moveable agricultural machines, and the accurate judgment which he has formed of it:—"The shafts are fixed on the sides of the body, above the bottom of it, which admits of placing the bottom on a level much below that of ordinary carts. This arrangement certainly possesses advantages—the loading is more easy, the centre of gravity is lower; and, consequently, its stability is very great. But these advantages are counterbalanced by considerable inconveniences: for instance, the smallness of the wheels, which increases the draught considerably, and makes such carts exceedingly difficult of use in these countries of bad roads and damp soils; the complication of this arrangement, which tends to increase its price, and, in short, the absence of solidity arising from the same complication, which causes its tractive power to be lost." To resume our quotation, Mons. Moll adds, "This cart presents all the characteristics of a show machine." It is sufficient to examine for an instant a specimen we found in the Exposition, to be an entire convert to his opinion.

The patent cultivator of Coleman is also called a drag-harrow or scarifier. It pares the ground in parallel vertical lines, at the same time that it cuts horizontal subsoil trenches. The penetration depth of the shares is regulated by a vertical lever, which can be raised or depressed.

The Crosskill clod-crusher is already too well known in France to make it necessary for us to give any long description of it. It is composed of a certain number of cast-iron discs, having the form of toothed wheels. It has been used for nearly a dozen years in England, to roll the surface of sown land, to crush the lumps of earth, to place a light covering of earth over the bare plants, and to destroy the wireworm and grub. The principal advantage of this instrument is the moveability of its discs, each of which revolves independently round a common axis, the result of which is that they do not clog themselves. Crosskill's clod-crusher is the most useful invention of modern times, and has been introduced into France free of duty, whilst it is still patented in England. The wheels are a very important adjunct. Formerly they were obliged to dig holes on each side of the roller, in order to place it on the ground, and raise the two wheels which served for its transport from the farm to the field; but now, by means of a curved axle-tree and a very simple piece of mechanism, the roller is placed on the ground, and the wheels are elevated above the soil in the twinkling of an eye. In England the use of the spade disappears more day by day, and steel forks have replaced it almost everywhere. These have the advantage of being very light, of penetrating the ground with less effort, and making better work in close soils than the spade. English workmen use this instrument with handles scooped out, like the handle of a spade. The fork has from 3 to 4 or 5 or 6 prongs, and the 5-pronged one is called the "Universal Fork;" the

* The time is not mentioned.—*Translator.*

3-pronged one is more especially used for drainage. These forks have gained three of the English Royal Agricultural Society's prizes.

The custom of exposing every side of the hay to the air, by means of an ordinary rake and a two-pronged fork, has, I believe, been practised for all time. It is the weapon of the hay-makers, armed with which, and bronzed by the sun, they are represented by our painters in the picturesque attitude of their calling. They have attempted to introduce machines which have hitherto been handled by women into their labours. The steel-tooth rake, drawn by horses, and invented by Messrs. Howard, is destined to carry out this object. It has obtained the two first prizes of the English Royal Agricultural Society. This rake serves to rake the hay, the corn, the stubble, or the twitch grass. Steel teeth have been substituted for the iron ones, which are much lighter and stronger. They do not get bent, and, moreover, require much less traction. By the aid of a gauge and a quadrant, they can alter the style of raking so as to make the points of the teeth act more vertically, or set more or less off the ground. The bar running under the teeth, is so arranged as to adapt itself to all the undulations of the surface. The frame is entirely of wrought iron, and the teeth moveable and independent.

Mr. Smith has exhibited a machine which is intended for the same use, but more especially for hay-making. It is entitled in the official catalogue, "*A Machine to Mow the Hay.*" We must not place too much reliance on the catalogues and numbering in the Palace of Industry, if we wish to avoid the grossest errors. This machine of Mr. Smith's was discovered in the year 1816 by one Robert Salmon, of Woburn; and "*The Country House in the Nineteenth Century*" has given a description of it. It is simply a cylindrical carcase, armed with rakes, and revolving round an axle-tree of two wheels which support the machine. Mr. Smith has made some wonderful improvements in this machine. The cylindrical frame which carries the rakes is divided into two parts of one metre* in length, which have each an independent movement. A cog-wheel communicates the rotary movement to two cylinders. Each cylinder has eight tine-bars, on which rakes with five teeth are fixed by means of springs, which makes 16 rakes with 80 teeth in all. The springs yield whenever the ground presents any unevenness, and the distance of the teeth from the ground can be regulated at will. They sweep the ground before and behind, and scatter and separate the blades of grass after having tossed them up in a lively style. In one hour this machine turns over an acre of land, or, in fact, does the work of twenty hay-makers. Nevertheless, its action is perhaps too rough for artificial grasses, the leaves of which it would separate too violently; but when applied to hay, it is a double economist of both time and hard labour.

Whitehead's machine is designed to make drainage-pipes, tiles, and hollow bricks. It is held in very high esteem; and Mr. Josiah Parkes has commended it as the best for the making of drainage-pipes. It is single or double. Our drawing represents the latter, which works in both ways by means of a double set of boxes and pistons, and costs 775 francs. The machine of only one movement consists simply of a rectangular cast-iron box, covered with a wrought-iron lid, and produces 8,000 pipes a day, while the double turns out 12,000. There is also a third machine of a simple and similar construction, but smaller. These machines can be put in motion by means of any impeller whatever—hand-power, water-power, or steam-engine.

Messrs. Barrett and Co. have exhibited an apparatus which can be adapted to pipe-making machines, bricks, &c., and is worked by means of two, three, four, five, or six horses.

To sum up, England has exhibited but few new machines. In our next article we shall continue an examination, in detail, of these machines, whose exact designs we shall give; and doubtless we shall find some old acquaintances, hallowed by time and practice, those two sovereign arbiters of all industrial inventions. We cannot make too many efforts to spread these endless inventions, which are calculated to produce a fertile revolution in the bosom of French agriculture.

WINTER FALLOWING.

When people unacquainted with farming matters consider the labour of the farmer to end, it really does but begin. A commercial man remarked to me the other day, Well, now that your harvest is ended, you may take it easy, any how. So far as I am concerned, the very reverse of this is true, for I am just preparing to be more busy perhaps than I have been all harvest. The nature of the work performed during the present and two following months is an all important subject for consideration. We now lay the foundation for the gain or loss of the year. Farming is no longer an easy business to those who seek a subsistence by it. The go-a-head spirit and quick business habits of the city is prevailing through the country; and as our farmers become more enlightened, and strive to combine science with practice, they must be willing to relinquish ease, and to superintend constantly operations that require the guidance of experience and a head fertile of resources. It will not do in times like these to be sticklers for precedent: there are occasions when precedents must be created! and if this is not a time for creation of precedents, there never was one. Has not the British farmer keener competitors than ever, in the struggle for life, and more of them? Has he not had two deficient

* A metre is 39½ inches nearly, English measure.

crops? Has he not a double income-tax (may be a quadrupled income-tax before this time next year) —increased taxes of all kind—and the vision of a reported tax upon farm horses? Has he not other heavy burdens that we all are conversant with, who have to bear them, pressing with a great weight, a weight that is truly somewhat relieved by the present improved price of grain? But this price cannot long continue, and it is pretty sure that our burdens will not cease to oppress us, when markets fall. It becomes all prudent people to make provision for contingencies. The chief provision the farmer can make is by arriving at a better and a less expensive system of management. The columns of this paper abound with numerous recommendations to this end, but none of them are of greater importance than that of the autumn cleaning and manuring of land.

The months of September, October, and November, may, upon the experience of the last few years, be reckoned amongst the brightest of the English months. The gift that Providence has thus made to us we should not be loath to turn to our advantage. In Scotland it is different; and yet it is Scotland, through one of her intelligent sons, Mr. Tennant, that shows us what, under such unfavourable circumstances as a northern climate must be subject to, may be done.

The Bentall may be set to work upon the bean and pea stubbles, or any other stubbles that may require such a cleansing preparation for the wheat crop. This may be done, and always is done by all men who have any pretension to be esteemed good farmers; but beyond this there is another work of preparation that has been tried with the most astonishing results by a few of our most eminent leaders in the march of agricultural progress. I refer to what may be called winter fallowing. So soon as the grain crops are harvested, the light grubber (and there is none better than the Bentall) must be set to work, going over the whole field several times in opposite directions, so that to the depth of six or eight inches the whole surface soil is moved, the weeds are torn up and brought to the top, where, after repeated harrowings, they are left denuded, for the winter blasts. For disintegrating the soil, and cleaning it, this process is indisputably the best we can adopt. When roots of couch-grass, &c., are freed from the soil, and fully exposed to the vicissitudes of weather, at a season when their vital power is at its lowest point, they must die. Under similar circumstances in spring, with their vital energy in full play, the slightest root-hold preserves their vitality—like Anteus, they must be lifted out of contact with mother earth, before they can be vanquished. But so completely does the winter process kill them, that they may be ploughed in, on the return of spring, with impunity; so that, mark me, ye staunch sticklers for the plough, whether with four horses or two, spring and summer fallowing is superseded, and cleaning land may be accomplished oftentimes without a shilling's outlay for raking, picking, carting, or burning.

Nor must we lose sight of the advantages derived from the exposure of the soil to the action of frost, in such a desirable state. Disintegrated by the autumn grubbing and harrowing, how can it fail to receive infinitely more benefit from frost, and thaw, and rain, than when merely reposing in compact furrow-slices? There is, by the adoption of this plan, no time lost in spring in the work of preparation; and a certain seed-bed, formed by the action of the frost, is ready to receive the seed, and bring to life the plant with the greatest possible advantage. The subject, however, will bear further notice on another occasion. But before the process of winter fallowing, however desirable, can become a recognised part of our system of husbandry, we must be possessed of more extended means for making it so. Our horses seem, as soon as harvest closes, to have, by reason of the introduction of the somewhat recent process of tilling, even more than they can do. Many a foul stubble is ploughed up for wheat that should be cleaned, under the present state of things. It will not do to buy horses expressly for the autumn; for were such a practice general, they would be bought in extravagantly dear, and sold out ruinously cheap. Some might hire chance teams; but it is very evident that the majority of farmers must needs go on in the usual routine, and put up with the old summer-fallow process, costly and ticklish enough as they all know it to be, except some foreign power can be brought to serve their turn. Nor did the Carlisle meeting fail to educe the hoped-for principle, by which this power—steam—is to be applied for our use, although on many hands we heard that there was "nothing new, nothing at all feasible." In the very ingenious invention of the Messrs. Fiskens, the observing at once recognised what they sought, and exclaimed, "The problem of steam cultivation is for the first time solved!"

Allow me to remind my readers of the great importance attached by our common friend, the lamented Mr. Pusey, to the forking up of couch by hand labour, during the autumn and winter, from the stubbles. We have reason to believe that the attention he so wisely aroused to this necessary portion of farm practice, is the foundation for that improved system of cultivation I now advocate. While labour was plentiful and cheap, the fork sufficed; but with scarcity of labour, the introduction of that machinery was necessitated, which should take the place of the thousands of emigrants. Great numbers of paring machines, broadshare ploughs, &c., sprang into existence obedient to the call of neces-

sity; and throughout the length and breadth of the land may be heard, at every market table and agricultural gathering, discussion relative to the paring and cleaning of stubbles in preparation for wheat seeding.

But some of our more advanced farmers are adopting a practice which prepares now, not only a seed-bed for the wheat kernel, but a bed also for the fickle turnip seed. I stated last week the theory upon which such a mode of management is justified, and from a work recently published I shall introduce a description of that mode itself. "The great aim in the culture of this farm (Messrs. Outhwaites', in the North Riding of Yorkshire) is the early preparation of the land intended for the turnip crop; to this all other work is postponed, after the corn crops have been secured in autumn. The stubbles are then stirred in one direction by Biddell's scarifier, the sharp-pointed tines being used in this operation, and the ground torn up to the depth of 5 or 6 inches. After the field has been gone over once, the scarifier is fitted with the broadshare tines, and made to cross the former stirring at right angles, thus tearing the ground to pieces, and disengaging the stubble and roots of weeds and couch, which are drawn together on the surface by the harrows, then gathered by the horse-rake, and laid in a heap, to be carried home for littering the cattle yard. The land now thoroughly pulverized is ploughed with a clean deep furrow, and in that state is left exposed to the influence of the weather till spring, when it receives one furrow more, and is found in fine condition for vegetating the seed of the turnip crop." The expense of this plan is about £1 2s. 6d. Upon very light lands the same has been tried at an expense of 15s. per acre, where the weight of the crop has been 30 tons per acre! The advantages between such a saving and such a result are apparent enough, without any effort to make them so, to all who have on the old method been in the habit of giving their land three or four spring ploughings—by which *if* the weeds were destroyed (?) the land ten-to-one is poached—at an expense of £3 to £4 per acre! Here is a distinction not without its difference!

And with this practice we may also suggest, too, the importance of manuring land so prepared for the root crop. Those who after great expense have succeeded in obtaining a beautiful mould in which to deposit the seed, and have had the vexation to see all their hopes disappointed by the consolidating pressure of the manure carts after one of those heavy showers that characterize the turnip-sowing season, will be ripe perhaps to receive this innovation, this alleviation of their anxieties. The presence of long manure in the land during the winter has the best possible effect; it keeps the land open, facilitates the circulation of the atmosphere from which the soil absorbs those properties which are to aliment the plant, and puts aside the plan of spring carting at all. If 15 loads of manure before winter are applied, a rich friable mould created (by the means mentioned), and, in addition, if one to two cwt. of guano is drilled in with the seed, the "sure and certain hope" cannot be presumptuous. All that human ingenuity can effect to prevent failure seems to be done. Success is as certain, this diligence and precaution being observed, as success can ever be, in this uncertain world.

Further advances on some descriptions of land have been made. The field that has been broadshared, cleaned, and manured, has been sown with tares, which, having been eaten off by sheep, or mowed for cows and horses, the land is ploughed with a thin furrow, rolled, harrowed fine, and drilled immediately with turnips. But circumstances must be very favourable to admit of such a feat.

It may be objected that the cleaning of land during the autumn cannot always be accomplished. Our operations are all open to like objection. There is, however, scarcely ever a season totally unfavourable to the practice—scarcely ever a season in which we cannot grub out the rubbish and cart it, though in a wet form. It is often impossible to burn it; and the next best way of disposing of it, and rotting it down into a good drilling compost, science teaches us—"throw it in a heap mixed pretty freely with lime." If the impossibility rests in the lack of horse-power, a remedy may be found. The giant Steam seems a willing and withal a good-tempered bondsman—why can we not lay our hands upon him, saying *Serve us?*

The test of economy can any day be fearlessly applied to *clean farming;* and what is the true foundation of clean farming, if it be not that attention to autumn stubbles advocated above? Such a course shall be seen to simplify the whole work of cultivation, and to afford us a result the most sanguine amongst us have little anticipated.

Let those who have not grubbers and broadshare ploughs quickly purchase them, and set earnestly to work, lest a season already far advanced rebuke their sluggard improvident movements, and another summer shine upon a failing, patchy, profitless, and disappointing turnip-crop. Instead of three or four pounds expended upon such a miserable failure, determine to secure a fine crop at an expense of one pound or thirty shillings, assured that you have commenced a system that will require less cultivation, and will yield you greater crops of superior quality.

F. R. S.

SUGGESTIONS FOR AGRICULTURAL STATISTICS.

1. The Report of the Lords' Committee is in favour of employing the Poor Law Board for their collection, but we see no sound reason for troubling the Poor Law officials, as if the returns are made compulsory there would be no occasion to trouble the Guardians of the Union. Nor is it desirable that the relieving officer of the Union should be diverted from his ordinary duties, which, as a general result give him full employment. For instance, in the Hemel Hempsted Union, comprised of five large parishes, with an area of 25,000 acres, the relieving officer has weekly to call upon 200 different poor persons to distribute relief, living in widely separated parishes.

2. We are of opinion that the collection of the returns should be made by the local officers of each parish, either through the collector of the poor rates or by the collector of assessed taxes, who is not the assessor of taxes but a permanent parish officer, who is in the habit of sending out schedules to every occupier of land. The Board of Trade to have the option of either one or the other of such officials.

3. We consider it highly desirable that the returns shall be re-delivered by the occupier at the residence of the collector, on or before the expiration of the fourteen days allowed for their completion after the 21st of October, as he would in many instances, when calling for them, find the occupiers from home, and some of the schedules not filled up, which might lead to disputes. The schedules may be filled up when deemed desirable by the occupier, and addressed to the county inspector, having the name of the occupier written on the outside when returned to the collector.

4. The employment of the relieving officer of the Union, even of re-delivering of the schedules was enacted, would cause great inconvenience to the majority of the occupiers, four-fifths of whom live many miles from the residence of the relieving officer, as the Union is 10 miles in length and 8 broad, and contains about 250 occupiers.

5. The county of Herts, contains 12 unions, and the employment of the clerks of the union would not be required to classify the schedules if they were sent to a county inspector, to be appointed by the Board of Trade, whose required salary need not be in excess of the proposed payment of the union clerks—and a further important question arises as to who shall authorise legal proceedings against defaulters. Our opinion is, the county inspector would be the better authority, and the services of the clerks of the union be altogether dispensed with.

6. The penalty for non or defective returns should vary from 40s. to £5, according to the extent of occupation, or the nature of the offence, whether from wilfulness or negligence. We suggest that the parish collectors be paid 1s. for each return by the overseers of the poor, on receiving a certificate from the county inspector, and all penalties for defective or non returns should be paid to them, who would thus have an interest in the defaulters being fined. The payment of the parish collector in small parishes would only amount to a few shillings, and in the largest parishes seldom exceed £2 or £3, which in many instances would be amply covered by the penalties enforced.

7. We are of opinion there would be no necessity to employ professional agents to make up returns for wilful defaulters, as their extent would have little effect on the aggregate returns of the county; and there can be no doubt that when a few penalties have been enforced, there would not be many defaulters after the first year.

8. With the view of enabling the inspector to enter the names of all occupiers in his books previous to the receipt of the returns themselves early in November, the parish officer or collector should on the 10th of June in each year send to the inspector a list of the occupiers, taken from the rate-books, with the extent of their occupations regularly numbered, which inspector could then enter into his books, and forward the required number of schedules for each parish on or before the 21st of October.

9. The Lords' Committee recommend the filling up the returns and their delivery, as regards the acreage, by the 15th of July; but that would require another return in October, to obtain the probable yield and quality of the crops of grain and potatoes on the 21st of October.

10. The results of the late harvests have clearly shown the necessity of deferring the returns to the 21st of October, as the failure of the wheat crop from mildew and defective yield was not apparent until after it was reaped in the last week in August and September; nor can the extent of such deficiency be fully ascertained till a portion of the crop is thrashed out, which will have taken place by the 21st of October, to a greater or less extent, by every occupier for sale in the market or for seed.

11. The failure of the potato crop was not apparent this year until the middle of September, but the extent of the disease will be known by the 21st of October.

12. We think it desirable the returns should, in the first instance, be confined to occupations of 5 acres of arable and 10 acres of pasture land and upwards. The Board of Trade might at a future period extend them to lower occupations if deemed desirable.

13. Where the counties are large they might be divided, and more than one inspector of the county appointed. Each inspector should not have to superintend more than 3,000 returns, for the sake of their early classification in the month of November.

14. By the above suggestions the Board of Trade would have the sole direction of obtaining the required returns, without the necessity of depending on the Poor Law Board, or diverting the Poor Law officials from their customary duties, and likewise avoiding the expenses of their employment.

SAMUEL SANDARS.

Hemel Hempsted, Oct. 2, 1855.

THE WOOL TRADE.

NO. I.

BY AN OLD NORFOLK FARMER.

Presuming that the wool trade and the manufacture connected therewith cannot fail to be a subject of deep interest to the agricultural readers of the *Express*, we propose to present them, in a series of letters, with a concise history of that trade, from the period of the Roman Conquest of this island to the present day. Its importance in a national as well as individual point of view, is second to no part of the whole range of commerce, whether we consider wool in itself, as a staple article of agricultural production, or the manufacture to which it is applied. In both capacities it has for centuries been the subject of anxious but mistaken legislation, to which may, in a great measure, be attributed its slow progress when compared with other branches of commerce. This is proved by the rapid strides it has taken since legislative interference has ceased, and both the trade in wool and its manufacture have been left to their own free and unfettered energies.

The actual and abstract necessities of mankind—those I mean which apply to *all*, and the providing for which, in one shape or other, cannot be dispensed with by any, —consist only of shelter, food, and clothing. Civilization, it is true, has created a multitude of wants; but beyond these three, she cannot *create a necessity*. With these supplied, in however humble a way, life may be sustained in comfort, where luxuries are unknown. It is with the last of these elements of man's necessities that we have now to do.

The clothing of mankind has furnished one of the chief sources of employment and consideration in every age and nation of the world since the fall; but more especially wherever civilization has extended itself. The frail and temporary covering adopted by our first parents, for remedying that deficiency they then were made sensible of, was soon after exchanged for "coats of skin," with which their Maker clothed them. How soon the idea of converting the wool and hair of animals into clothing was entertained, we have no certain information; but from the incidental notices in scripture, that in the second century after the creation of man, the "harp and organ," with works in "brass and iron," were in use, we have reason to believe that such a conversion was not unknown. Soon after the flood, however, we gather from both sacred and profane history, that both wool and flax were used in the making of clothing, and that the hair of camels and goats was also used for the same purpose. These afforded employment for all ranks of persons, from the Queen to the domestic slave, or "handmaid." It was one of the distinguishing marks of a virtuous woman, in Solomon's days, that she sought "wool and flax, and worked diligently with her hands"; and that "she layeth her hands to the spindle, and her hand holdeth the distaff." Such were the primitive manners of Court ladies in his time; but, with this slight reference, we must pass over the more remote history of these matters, and come to that of our own country, the immediate object of this letter.

The wool of England (or Albion) was in great request on the continent at the period of the Roman conquest. Cæsar speaks of it in his Commentaries, as forming a considerable article of commerce, and asserts that its fibre, or staple, was finer than that of Spain. This is easily accounted for, by the nature of wild and uncultivated heaths over which the flocks of sheep roamed. Cultivation, whilst it has increased the quantity, has deteriorated the quality of our wool; and we find that the Spanish sheep, which were introduced into England by George the Third, soon lost that characteristic fineness in the fibre of their wool for which they were noted at home.

The first laws passed for the encouragement of the woollen manufactures and the protection of sheep, were those of Alfred the Great, in 885; and the laws for the destruction of wolves, during his reign and that of his successor, were mainly for the same purpose; and so effectually were they carried out, that in a few years not a wolf was to be found in the country. From that period the number of sheep and the produce of wool rapidly increased. When Richard the First was taken prisoner in 1193 by the Duke of Austria, as he was returning from the Crusade, his ransom was, in part, paid by one year's produce of the wool of England; which was collected for him, *on loan*, by the religious orders of the kingdom. At that time English wool sold abroad at 2s. 6d. per lb., which is fully equal to four or five times that sum now.

At this period of our history, the manufacture of clothing was almost wholly a domestic employment in the remote and secluded parts of the country; as it is, even at the present day, in some of the German States. The badness of the roads and difficulties of travelling, with the scarcity of money, and, above all, the simplicity of manners, rendered it necessary for all persons in the country to be, in whole or in part, their own manufacturers. The females of the family were employed in cleansing, combing, carding, and spinning the wool, which was then either woven by the male branches, or put out to a weaver, who obtained his livelihood by thus working for his immediate neighbours. It was long after the Norman Conquest, before the woollen manufacture began to assume that importance, which it has since maintained as a staple article of the commerce of the country.

During the reigns of Henry the Third, Edward the

First, and Edward the Third, the growth of wool and its manufacture was a special object of royal patronage. The latter Sovereign invited foreign manufacturers to England, and for their protection made laws which prohibited the importation of foreign woollens; and by the same law, the exportation of wool was made felony, and punished by transportation. The exportation of woollens was greatly promoted in this reign, and the city of Bruges, in Flanders, was appointed to be the "staple," or market beyond the seas, for their sale, to which foreign merchants resorted to make their purchases. This word *staple*, or *stable*, from being first applied to a city or town whither merchants were compelled by law or by a joint agreement to carry for sale, or to purchase, certain descriptions of goods, came in time to be applied to the goods themselves. Thus the *staple* articles of British produce were wool, leather, cloth, and lead.

The establishment of the woollen manufactures at Wakefield, Huddersfield, Leeds, and Halifax, in Yorkshire, took place in the reign of Henry the Seventh, towards the close of the fifteenth century. The coal-pits in the vicinity of those towns were greatly to the advantages of the manufacturers, and they prospered exceedingly; but the great impetus to both the woollen and other manufactures in England, was given by the wars in the Netherlands, in the reign of Philip the Second of Spain, and prosecuted by his ferocious minister, the Duke of Alva. The persecutions to which his Protestant subjects, the most industrious and intelligent of the community were subjected, drove them in thousands to seek an asylum in England, where Elizabeth and her subjects received them with open arms. A vast number of artizans in the wool trade thus found refuge here, and settled in Wiltshire and the adjoining counties, where the extensive Downs, covered with a fine sweet herbage, were peculiarly adapted to the breeding of sheep, and the production of a superior quality of wool. The ascendancy which these poor foreigners then obtained over the manufacturers of Yorkshire, by the excellence of their goods, has been maintained by their successors ever since, by the superior quality of their broad-cloths, which always fetch the highest price in the market.

Thus did the folly and wickedness of the Spanish monarch give a preponderance and an importance to the British woollen manufactures, far beyond that of any other country in Europe. Antwerp had previously been the great mart and store-house for the deposit and sale of goods from all parts of Europe. Four hundred vessels have been brought by one tide up to her quays, and two thousand five hundred have lain in the river at one time. A thousand waggons arrived weekly, bringing the produce of France, Germany, and the neighbouring States, and returned laden with goods the produce of the city; and ten thousand carts were daily employed within its walls, or in conveying goods into the adjoining country. The whole of this profitable trade was destroyed with the city itself, and its inhabitants were all massacred or banished. England and Holland were the gainers by these disasters, and extended their commerce to all parts of the globe; whilst the warehouses of London and Amsterdam became the depôts for the goods of continental Europe.

Thus the commencement of a new era in British manufacture dates from the twelfth year of Elizabeth; but the age was not sufficiently enlightened on the subject of commerce to allow it a free and unfettered action. "If the commerce of Great Britain," says a modern writer on this period, "and the woollen trade in particular, can date its extension from that period, it has been in spite of, and not by virtue of, legislative interference on its behalf. . . It is curious to trace its progress in the alternations of friendly commercial interchange with waspish petulance, from the moderate impost upon the goods of a favoured nation, to the stringent and prohibitory duty inflicted upon the avowed commercial rival. And then, the increasing vigilance required to prevent the running of goods, on both sides, the loud complaints of the manufacturers and merchants of their inadequacy, and the demands for more stringent protection; not to mention the national jealousies, the hatreds, the reprisals, the wars, engendered by these courses; all forming as instructive a lesson as history can furnish for the study of a legislator. A writer of a "History of Wool,"* whose work was published about the year 1750, has given a full and detailed account, year by year, of the progress of legislation on the wool trade; and his investigations, even at that period, had the effect of enlightening his own mind, at least, on the impolicy of prohibitory, if not of even protective enactments."

The Acts of Parliament of this period for the encouragement and protection of the wool trade and manufacture amounted to several hundreds; some of them going so far as to controul the marking and branding of sheep, cleaning the wool, &c., and extending to the minutest operations in the economy of the trade. The same system was pursued in the following reign, and well nigh destroyed the entire commerce of the country. One Alexander Cockayne having discovered the art of dyeing wools, which had previously been monopolized by the Dutch, James the First not only granted him a patent, to which he was justly entitled, but, to protect him in its exercise, prohibited the exportation of undyed woollen cloths. The Dutch, who were the best customers of the manufacturers, so deeply resented this measure that they instantly formed a league with the Germans and the States-General, mutually agreeing to banish *all* English woollens, dyed or undyed, and inflicted prohibitory duties on other descriptions of goods. In consequence of this impolitic measure, the manufacture retrograded materially during this reign.

The civil wars during the reign of Charles the First prevented both the improvement and extension of commerce, and the same prohibitory and fettering enactments continued to embarrass the manufacturers. Even Cromwell prohibited the exportation of wool, on pain of confiscation; notwithstanding which, however, it did not prevent immense quantities from being smug-

* John Smith.

gled out of the country; in consequence of which the price rose so high that the manufacturers loudly complained, and demanded still more severe restrictions.

Previous to the reign of Elizabeth "The Merchant Adventurers," a chartered company, enjoyed exclusive privileges of commerce with the continent, and were the largest traders thither. But having fallen out with the merchants of Russia, and other states, they were in consequence dissolved as a privileged company, but were allowed to trade upon the same footing as other merchants. After the restoration, however, the "Merchant Adventurers," under the name of the "Hamburg Company," obtained a renewal of their charter. Heavy charges were soon brought against them, of causing a great decrease of commerce by their operations; and they were further accused of smuggling wool out of the country: in consequence of which, fresh enactments, of a more stringent nature, were passed, making the export of wool a felony, and subjecting the smuggler to transportation.

These severe measures neither injured the foreign, nor benefited the British, manufacturers; for, what is not a little remarkable, *the act of prohibition was never once enforced;* although it was not repealed until the reign of William the Third. On the other hand, the severity of the foreign counter-prohibitions, reduced both the price of wool, and of woollen goods, to such a degree that several of the manufacturers emigrated to the palatinate: and, taking their workmen with them, established woollen manufactories there. And throughout the entire north of Europe prohibitory duties were laid upon *all* English woollens, to the entire destruction of several branches of the trade; whilst that of fine broad-cloths was shared with the Dutch, who supplied the markets of Turkey, Italy, Spain, and Portugal, the only countries which remained open to the English manufacturer. The only branch of the trade the latter retained intact, was that of coarse woollens manufactured from their own native wools.

London, Oct. 19.

THOUGHTS ON THE PRINCIPLES WHICH OUGHT TO REGULATE THE LETTING AND TAKING OF A FARM.

BY W. H. ZEIGLER.

Before entering upon the principles which, in my opinion, ought to regulate the letting and taking of a farm, perhaps it would enable us more clearly to define that subject, if for a few minutes I directed your attention to the general practice pursued in this district for many years past.

Having had the opportunity of both letting farms and taking one, as well as assisting others to do so, I shall endeavour to give you both sides of the question according to the best of my experience.

An owner of property having a farm to let has usually an agent employed to assist him in the management of his estate, that agent being generally either a lawyer or an agriculturist. In consulting together they arrange the boundaries of land, and what farm offices ought to be apportioned to it; they next agree upon the various clauses of a document, termed an agreement, which, being printed, is ready for the signature of the landlord on the one part, and the tenant on the other. These clauses embrace a variety of matter, having as an object the protection of the owner, and the restriction of the tenant to a certain course of action in the management of his farm. I here notice a few of these, namely—

1st, A clause stating land and acreage.

2nd, Rent, and the term of holding.

3rd, Repairs of buildings, gates, fences, &c.

4th, Refers to the preservation of game, fish, &c.

5th, Dictates the management of certain fields, one to be kept as a meadow; another to be pastured but not broken up; a third may be ploughed, but two corn crops may not succeed each other; a fourth allows the tenant to mow a crop of clover grasses only once annually; a fifth binds the occupant to consume all the hay, straw, &c., grown on the farm, while the manure thus made must be spread upon the clovers and meadows.

6th, Engages the tenant to board a dog and cock for the landlord, if required.

7th, 8th, and 9th, Hold over the tenant's head threatenings of re-entering, executions for debt, penalties of ten pounds per acre, &c., in case of non-fulfilment of contract.

A tenant applies for the farm in question, and the said document is put into his hand as the "conditions of letting." He reads it over, thinks there are a great many restrictions, and commences making a few objections to the agent, just in the way of trying of what metal he is composed, when a few hints from the latter give him pretty clearly to understand that this printed agreement corresponds exactly with all the other leases of the estate, and that if the applicant thinks it hard or unfair, "there are many others waiting for the next refusal." The poor farmer begins to reason with himself, "Well, I shall be no worse than my neighbour if I sign this paper; and I dare say many of the exactions will not be put in force; both landlord and agent have a good name in the country, and, perhaps, when I get fairly settled and see how I get on, some of those clauses will be relaxed in my favour." The bargain is struck, and the document signed.

Such is an outline of the agreements existing generally between the landlords and tenants of this district (with a few exceptions); and taking for granted that your experience will corroborate my own, I at once pass on to the question entrusted to me, viz., the general principles which ought to regulate the letting of a farm.

A question arises here—Who are the parties interested in this engagement? I take them to be—First, the landlord; second, the tenant; third, the farm labourer; and lastly, the public. The first three directly: the fourth indirectly. Each of these parties has, in my opinion, not only an interest in the settlement of this subject, but also a claim of rights to support clearly, apart from one another, and yet when blended into one forming a structure of great national power.

I. What are the rights of the landlord?

1st, To let his farm at the highest rental which a free and unrestricted competition for land will enable him to obtain.

2nd, In letting a farm the owner is justified in expecting a tenant of education, moral character, professional skill, and ample capital.

3rd, The landlord ought to have security for the due payment of rent and fulfilment of contract.

4th, The state and condition of land and buildings at the time of letting having regulated the amount of rent offered and accepted by the contracting parties, the owner ought to receive current interest upon sums expended by him in any improvements desired by the tenant.

5th, The landlord is clearly entitled to sufficient money guarantee that his property will, in its cultivation, suffer no loss or depreciation in value at the hands of the tenant.

I would here suggest for discussion a proposal which I think if acted upon would protect the landlord from any injury at the hands of the tenant: So soon as a farm is let, three known practical men, selected by the contracting parties in the usual way of arbitration, should be appointed to examine the farm, draw up a report (a copy of which should be lodged with both of the said parties) of the state and condition of the land and premises, in terms as minute as possible, containing a memorandum of the average prices for that year, of the various stock and crops, sold at the nearest markets, with any other data which the examiners may consider useful to guide and assist others, at the close of the lease, who, being similarly appointed, should also make a report of the then state of the farm. The latter commissioners, taking both reports into consideration, should determine the amount of damage incurred by mismanagement which the landlord may be entitled to, or that of compensation, which, from its improved state, they may award the tenant.

II. What are the rights of the tenant?

1st, Security of possession for a certain number of years, in other words, a lease.

2nd, No dictation on the part of a landlord as to the cropping of the farm or its general management, nor interference in the disposal of its produce.

3rd, Compensation at the close of his lease for any improvements effected by him which has enhanced the value of the occupation.

Amount of compensation to be regulated by arrangement already propounded. (See No. 5—Rights of landlord.)

I would here suggest for discussion the desirability of a clause being introduced into the lease, that in the event of the death of either of the contracting parties, the executor of the deceased should have the power, if he thought fit, to bring the lease to a termination on the principles suggested in note No. 5, landlord.

III. What are the rights of the labourer?

1st, The labourer, like the tenant, being a necessary party to the cultivation of the farm, is entitled to a house and garden upon the farm.

2nd, Security of place and wages for a certain period.

Lastly, What are the rights of the public?

The public, being an indirect party to the engagement, has only an indirect voice in the matter, but is not the less entitled to consideration in weighing the interest of this important subject. The income, taxation, and comforts of the public being in a great measure regulated by the price at which the bread of the people is disposed of to them, and that price being much effected by the quantities raised and the management in raising them, I think the public should be regarded as saying to the landlord—"You, in letting your land (having sufficient guarantee against the injury of your property), ought to throw no obstacle in the way of those engaged in producing the food of the people, so that our markets may be amply filled and our poor amply fed." To the tenant the public might say—"The manner of cultivating the land entrusted to your management, while it more closely affects your family, affects also the interests of the country, and so we expect that ignorance and insufficiency of means should give way to education, energy, and amplitude of capital."

Thus, I have endeavoured to give the leading principles which ought, in my opinion, to regulate the letting of land; and while I have thrown out these few suggestions for discussion, I am well aware they far from exhaust the subject, neither do they touch upon a very important and inseparable branch of that subject, viz., the regulations affecting the relationship of out-going and in coming tenants. I leave that department to some more practical and experienced person.

Allow me, in conclusion, to state my belief that if the land market of this country were thrown open in such a manner as I have suggested, there would neither be a want of men nor capital to raise the standard of farming in this country, so as to meet the growing requirements of the population, and remove the stigma which has so long rested on the occupation of the farmer.

CHEDDAR CHEESE.

The following directions for the manufacture of Cheddar cheese are issued on the authority of the Committee of the Ayrshire Agricultural Association on Cheesemaking:—

Immediately after the morning milking—say at seven o'clock—the evening and morning milk are put together into the tub. In summer the temperature of the whole is brought to 80 degrees, by heating a small quantity of the evening milk. In spring or autumn, when the weather is colder, the milk may be heated to 83 or 84 degrees. The temperature should always be ascertained with precision by the use of the thermometer.

When the desired temperature is obtained the rennet is added in the usual manner. Pure, well-flavoured rennet is indispensable.

After the rennet is added, an hour is requisite for coagulation.

At eight o'clock the curd is gently broken and allowed to subside a few minutes, in order that a small quantity of whey may be taken off to be heated. This whey is put into a tin vessel and placed in an adjoining apartment to be heated in hot water. The curd is then most carefully and minutely broken, and as much of the heated whey is mixed with it as suffices to raise it to 80 degrees, the temperature at which the rennet was added. It is then left for an hour.

A little after nine the work is resumed. A few pailfuls of whey are taken off, and heated to a higher temperature than at eight o'clock. The curd is then broken as carefully as before, and after this is done an assistant pours several pailfuls of the heated whey into the mass. During the pouring in of the whey the stirring is actively continued, in order to mix the whole regularly, and not to allow any portion of the curd to become

overheated. The temperature at this time is raised to 100 degrees, and the stirring is continued until the minutely broken pieces of curd acquire a certain degree of consistency. The curd is then left half-an-hour to subside.

The next operation is to draw off the whey. The greater proportion of it is lifted in a tin bowl and poured through a hair sieve, for the purpose of retaining any small pieces of curd that may have been lifted along with it. When the whey *above the mass of curd* is thus removed, the spigot at the bottom of the tub is turned, and the remainder is allowed to drain off, without any pressure being applied. After the most of the whey is thus drawn off, the curd is cut from the sides of the tub, and placed upon the convex centre. It is carefully heaped up, and left for half-an-hour, or a little longer, with no other pressure than its own weight.

The curd is next cut into large slices, turned over once on the centre of the tub, and left in a heap as before for half-an-hour. The whey flows away towards the sides of the tub, and drips from the spigot. At this stage the whey should come away very pure.

After this interval the curd will be nearly ripe for the application of pressure. But it must not be put into the vat to be pressed at too high a temperature. As the temperature is usually too high at this stage, the curd is broken by the hand into pretty large pieces, and placed upon a cooler until the temperature descends to 65 degrees, or thereby. The curd is then put into one or more vats, and subjected to a moderate pressure for a period of from fifteen to thirty minutes. The next process is to take the curd from the vat, break it finely by putting it through the curd mill, mix it with salt, and make it up into a cheese. A pound of good salt is sufficient for half a cwt. of curd.

The cheese which is commenced at seven may be carefully made and put into the press by two o'clock, where it remains till next morning. It is then reversed in the vat, and another cheese cloth is put upon it. The following morning a fine cotton cloth is put upon it to give it a smooth surface, and it is again reversed in the vat and pressed twenty-four hours, after which it is laid upon the shelf. During two or three days, over which the process extends, the pressure is continued for the purpose of consolidating rather than drying the cheese.

When the cheeses are taken from the press they are each laced into a piece of canvas, for the purpose of preserving their shape; but without any fillet a well-made Cheddar cheese retains its shape as well as a Dunlop cheese. At first they should be turned daily, and the time between the turning may be extended as they become firmer.

A temperature in the cheese-room of from 55 to 65 degrees is regarded as the best for ripening Cheddar cheese. In good weather, during the months of June, July, and August, the natural temperature of the atmosphere is sufficiently high; but at other times of the year, and also during these months if the weather be cold, a stove should be kept in operation in the cheese-room.

ON DEW.

The derivative meaning of the word "dew," in every language, relates most directly to moisture and humefaction. It is the humidity which the air, under certain circumstances, deposits in the form of minute globules on the surfaces of the bodies in contact with it. When the temperature of the atmosphere is below the point of congelation, the dew which might adhere to the substances exposed to it passes into the form of hoar frost; this appearance has been denominated hard frost, white frost, rime frost, and raw frost, in the various languages of the people who have made the observations.

As dew appears to collect only during fine clear nights, when the heavens glow with sparkling constellations, the ancients, in the infancy of science, imagined it to be actually shed from the stars, and therefore to partake of a pure and celestial essence: hence the vulgar notion that dew falls, which prevailed through all ages, and continues to tincture every language. The mythologists described dew as the daughter of Jove and of the Moon; and Plutarch asserts it to be most abundant in the time of full moon. The lunar beams being faint and cold, were supposed to exert some influence, and to reflect only a softened heat from the sun, and therefore possessed of a humefying quality.

Dew has always been regarded as a fluid of the purest and most translucid nature. The abstergent property was celebrated by the vulgar persuasion that it was able to remove all spots and stains, and to impart to the skin the finest bloom and freshness; it was even thought powerful enough to extend the duration of human life; and the longevity and robust health of mountaineers, in comparison with the inhabitants of the plains, have been ascribed chiefly to the frequent aspersion of dews on their gelid bodies. Alchemy employed dew as a most powerful agent, which was reckoned capable of dissolving gold itself; an external application was thought to correct any disposition to corpulence. Clothes were exposed during night, in order to catch the celestial wash of dew; and grasshoppers being lean in form were supposed to feed on dew as a meagre diet.

The philosophy of Greece, which studied facts, and made very close observations of nature, entertained far juster notions than the above-mentioned, concerning the nature and formation of dew. Aristotle, whose universal genius ranged over both the physical and intellectual world, closely studied facts, and sought to reason accurately from the phenomena actually observed, defines dew to be "humidity detached in minute particles from the clear chill atmosphere." In another place, it is stated that "dew is only formed beneath a calm and cloudless sky, but never in windy weather; it collects in low places, and not on the summits of mountains." Vapour being heat and water, rises during the day; but when the cold of night prevails, it discharges its humidity. Dew is most copious in fine weather, and in low damp situations; the production is checked by a north wind, but much encouraged by a gentle southern gale,

charged with humidity. A more intense cold congeals the humidity into a hoar frost: dew bears to hoar frost the relation of rain to snow—frozen masses of clouds forming the one, and attenuated low vapour, seized by frost, constituting the other. The heat of the sun's rays first raises the vapour from below; but in all the subsequent changes and modifications, the moon and stars, contrary to the earlier and more popular notions, exert no influence.

The Romans had reverted to the old opinions from the above tolerably correct ideas on the phenomena of dew. It is mentioned that dew falls, which continued as the prevalent notion throughout the middle ages, enlarged by a very silly enthusiasm about the ascent of dew into its original heaven, and its alliance with celestial purity. As learning advanced, the descent of dew was duly questioned, and at last fully refuted. It has always been observed, from the earliest records, that dew is ever most copious during clear and calm nights, and an idea has long prevailed that it is accompanied with a reduction of temperature. It was found that, strictly speaking, dew neither falls nor rises, but only separates, as Aristotle had already observed, under a certain change of circumstances, from the air, and attaches itself to some substances in preference to others; the theory of vapour assisted this opinion. Moisture is suspended in the atmosphere by a real chemical solution, in the same manner as nitre and other salts are dissolved in water. The solvent energy is in both cases augmented by the addition of heat. A rise of temperature enables the air to support a larger portion of humidity; while the decrease of it enfeebles the attractive power, and occasions a precipitation in the shape of mist or dew. This perspicuous explication, as we have seen, had been already anticipated, though but vaguely stated, by Aristotle.

A deposition similar to dew or hoar frost is hence formed whenever the air becomes suddenly chilled by touching any body much colder than itself. The walls of passages, vaults, or massive buildings, drip with wet during the early summer, before the heat penetrates to cause evaporation. The backs of houses are covered with hoary icicles when a long and severe frost is succeeded by a thaw.

The late Professor Leslie, of Edinburgh College, made several observations on the formation of dew, and found that the formation always began at the surface of the earth, and continued to mount upwards with the progress of the night; the general phenomena of dew were hence explained. In fine calm weather, after the rays of the declining sun have ceased to warm the surface of the ground, the descent of the higher mass of air gradually chills the undermost stratum, and disposes it to dampness till their continued intermixture produces a fog, or low cloud. Such fogs are toward the evening often observed gathering in narrow vales or along the course of sluggish rivers, and generally hovering within a few inches of the surface; but in all situations these watery deposits, either to a greater or less degree, occur in the same disposition of the atmosphere. The minute suspended globules, attaching themselves to the projecting points of the herbage, form dew in mild weather, or shoot into hoar frost when cold predominates; they collect most readily on glass, but seem to be repelled by a bright surface of metal.

The unequal heating of the surface during the day thus occasions a perpetual interchange between the higher and lower atmosphere, which is prolonged through the night, the warm portions of air still continuing to ascend, and leaving their place to be occupied by the descent of similar cold portions of that fluid. This vertical play is a provision of Nature for the attempering of the diurnal vicissitudes of climate.

In clear and warm weather the air is always drier near the surface during the day than at a certain height above the ground; but it becomes damper on the approach of evening, while at some elevation it retains a moderate degree of dryness through the whole of the night. If the sky be clouded, less alteration is betrayed in the state of the air, both during the progress of the day and at different distances from the ground; and if wind prevail, the lower strata of the atmosphere thus agitated and commingled will be reduced to a still nearer equality of condition.

The descent of chill air, caused by superior density, explains the formation of dew in low situations, and its progressive elevation as the cold accumulates. No dew is formed during windy weather, though the sky is clear, as the cold has not the efficacy to cool the ground in the necessary degree.

The late ingenious and learned Dr. Wells, in an essay on dew, published in 1814, has the merit of being the first person who distinctly attributed the formation of dew to the previous cold induced on the ground from the aspect of the sky. The chief observations are contained in a narrow compass. The coldness of the objects exposed was always found to "precede" the formation of dews, which continued, in favourable circumstances, to accumulate somewhat progressively during the whole night; so that from midnight to sunrise the deposition was even greater than from sunset to midnight. Dew was more abundant in the spring and autumn than at other seasons, and it was always very copious when the atmosphere inclined to humidity; for instance, in clear nights succeeding to misty mornings, or in clear mornings succeeding to misty nights.

The coldness which bodies contract from exposure must be augmented by every circumstance which retards the communication of heat. Hence loose and spongy materials are mostly affected. Thus in a clear night the grass was twelve degrees colder than the garden-mould, and sixteen and a-half degrees colder than a hard gravel-walk. In another bright evening, the surface of snow being nine degrees colder than the air, a piece of swan-down laid on it became still four degrees colder. Again, a lock of wool placed on a small table in the garden be-

seven and a-half degrees colder than the air; while swandown in the same situation acquired a coldness of eleven and a-half degrees.

The quantities of dew which attach to different substances appear to follow the proportions of their relative coldness. Parcels of wool, each weighing ten grains, being teased out into flattened balls of two and a-half inches diameter, and laid on a grass-plot, on a gravel-walk, and on fresh garden-mould, acquired during a clear calm night respectively sixteen, nine, and eight grains of humidity. In another favourable night, ten grains of wool laid on the table attracted sixteen grains of dew; while another similar parcel, suspended at the same height in the free air, acquired only ten grains. But the former must have also been much colder than the latter, since its confined situation—unlike the open exposition—would check the dissipation of the frigorific impressions; hence dew is always denser on grass than on the leaves of shrubs.

But the cooling of substances from exposure, though one great source of dew, is not the only cause of its formation. In low fogs—while the ground is scarcely colder than the incumbent bed of air—the humidity yet settles profusely on all bodies, even on the polished surface of metals. From experiments it appears that, from the height of two hundred feet, the temperature of the atmosphere in fine evenings decreases regularly about ten degrees, the colder and therefore denser portions being always thrown down to the surface. Hence the reason of the ancient remark, that dew is more copious in low vales than on the tops of hills. But the observations of Dr. Wells serve to confirm the general statement. A lock of wool exposed on a table imbibed, during a clear night, sixteen grains of dew; but a similar parcel placed immediately under the table, and consequently screened from the aspect of the sky, attracted four grains. In the latter case, the mere accumulation of cold air below must have occasioned the aqueous deposition.

This theory of Dr. Wells is founded on the hypothesis of "radiant heat," by which all bodies are supposed to throw off caloric to other bodies where the temperature is lower; consequently the earth is constantly radiating its heat to the high and colder regions of the atmosphere; that in the day-time the influence of the sun prevents this radiation; but during the night these effects become sensible, and reduce the temperature, unless when clouds intervene and arrest the rays of heat.

The interposition of clouds may prevent the radiation from the earth, but may also radiate heat back to the ground, and thus restore a portion that was previously abstracted. This may happen when the clouds are low and dense, to which Dr. Wells chiefly refers; but the general elevation is such that the temperature must be lower than the reduced temperature of the ground. But however this may be, the cold produced by a radiation to a clear sky is sufficient to account for all the phenomena of dew. The opinion that dew is produced by vapour emitted by the earth and vegetable substances has been satisfactorily refuted; and the contrary very clearly shows that a great proportion of it is deposited from the atmosphere.

The above theory of Dr. Wells, on the formation of dew, has been very generally admitted in point of accuracy, and that the general principle assumed as the foundation affords a satisfactory explanation of all the phenomena accompanying the production of dew, and that none of the apparent anomalies hitherto observed are sufficient of themselves to set that principle aside. The only objection came from Professor Leslie, who repudiated the theory of radiant heat, and substituted that of cold pulsations from the higher regions. The difference of these theories, and an examination of the relative merits, would lead to a discussion on heat that would be much too refined and silken-spun for common entertainment.

The production of dew is admitted on all sides to be a consequence of the nocturnal refrigeration of the atmosphere; and it is an established fact that the refrigeration after a clear day begins near the surface of the earth, and proceeds upward, the caloric escaping into the superior atmosphere and not into the earth. The moisture of the air is deposited in the form of minute globules on the surfaces of bodies in contact with it, when the surface of the ground is colder than the atmosphere. The difference of temperature which exists between day and night produces a variation in the quantity of water which the air contains. The water when precipitated from the air, instead of appearing as a vapour, is deposited on the earth in minute globules, and the air preserves its transparency: this constitutes a difference between fog and dew. When the air contains so little moisture that it can retain it during the lower temperature of the night, no dew is formed.

Dew is a phenomenon proper to clear weather. It is difficult to pronounce as to the whole of the causes which produce it; but the principal cause is the cooling of the air. When the cold is extremely great, the dew freezes, and then produces what is called hoar-frost.

In our island dew is observed like drops of rain upon the leaves of grass and vegetables, and on the earth very copiously, in the mornings of spring and summer, but occasionally throughout the year, in autumn pretty largely, and also in winter under particular circumstances. Windy and cloudy weather prevents any formation of dew; the greatest deposition being in a morning after a still and clear night which has followed a pretty warm day.

Dew forms in very different quantities on different substances under the same circumstances. Thus, on metals it is sparingly deposited; on glass it is formed abundantly; and on straw, grass, paper, cloth, and similar substances. Now, as the metals radiate heat imperfectly, and the other bodies in a greater degree, they become consequently colder than the metals, and hence condense more vapour into dew.

It has been observed over all the known world that local circumstances have a great influence in the production of dew, and that its presence is not regulated by any law of latitude or geographical position. Very hot countries enjoy most abundant dews, while others adjoining have little or none, though under the same parallel of latitude; temperate regions are seen to be wholly without dews, which are most copious and frequent in others that lie under the same degree of position. Heat, cold, and moisture are the chief agents; and the action and peculiar condition of these elements are required to produce dew, and these states are constituted by the local circumstances of each region of the globe. These influences are very many, and overrule the general conformation of physical nature.

Our island of Great Britain, small as it comparatively is, presents a very large difference over its extent in the production of dew. The northern portion, or Scotland, enjoys a very frequent and a most copious supply of dews, almost throughout the entire year, the only cessation being in the depth of the stormy winter. In the spring and autumn the formation is almost continuous, and, though less copious, the dew does not cease to appear in the height of summer. Even in that country the presence of dew is not regular and uniform; for while the eastern coast along the whole range is most abundantly supplied, the western parts enjoy a much less portion of dew, and in many places it may be said to be wholly absent. The colds differ in the eastern and western parts of Scotland: the former is dry, frosty, and piercing; the latter is humid, more dull, and heavy. The former seems more favourable to the formation of dew, as the atmosphere is more clear and calm. The eastern dews often impede every harvest-work till nearly midday: hay cannot be mown or tedded, nor any grains reaped. The prevalence in a greater or less degree reaches in eastern Yorkshire, and then almost wholly disappears. Any appearance of dew southward is rare and feeble.

The north of England enjoys the presence of dew in a moderate copiousness; while the opposite western parts are, like the western parts of Scotland, almost without any dews at all, at least in a general extent.

The whole extent of South Britain seldom possesses dews of any weight or abundance; the quantity is not sufficient for any purpose of moisture. The quantity of moisture is wanting in the atmosphere: the degree and kind of cold is not present; and the heat, though sufficient, is not of the thickened sultry quality which prevails in Eastern Scotland, in which the air is surcharged with vapour, and, being heated by the sun, renders the atmosphere sultry and suffocating. In this climate dew is most prevalent and copious, which shows that the necessary elements are present, and that they are combined in the peculiar degree that is required.

Dew is melted and evaporated by the rising sun, and forms the purest specimen of water. It forms by far the most agreeable moisture for plants, and ensures the success of all green crops over the whole extent of Scotland. The soils are also most peculiarly favourable, and, assisted by the dews, a failure of the crops seldom if ever occurs.

Dew is not produced in very wet climates, as in South Wales, where the rains are so abundant, and the winds blow so fiercely. There are wanting the clear calm skies and the dry frosty colds of eastern Scotland, which appear to be the peculiar requisites for the formation of dew.

A refrigeration of the atmosphere is called the chief cause of the production of dew: there must be added a certain degree of heat, and joined with a certain quantity of moisture in the atmosphere. The existence of the elements is only in certain places, and the combination of the elements only happens under certain influences; hence the very contingent appearance of dew, and the uncertain principles of its formation.

J. D.

HANSON'S POTATO-DIGGING MACHINE.—The first exhibition of this important invention was at the late Belfast Meeting of Agriculturists, in connection with the Irish North-East Agricultural Society. It is thus described:—The potato-digging machine is drawn by two horses, and supported by four wheels, from the onward progress of which the mechanism which performs the digging derives the required motion, the necessary power to scatter the tubers, break up the soil, and root up the weeds; and it is in every and all these respects alike useful and ingenious, on account of the combination of important results which arise from its digging and revolving operations. It is not only capable of digging the potato from every description of soil, without exposing the tubers to any risk of being injured, but, while it performs its work most efficiently and economically in these respects, it is also calculated to break up and pulverize tough and adhesive soils; and, by the revolving operation of the fork spades, forming the machinery which cleanly scatter out the roots, it effects at the same time the most complete mixing of the manure with the earth, and roots up and shakes out the weeds, and brings them to the surface.

SANITARY MEASURES AMONGST THE POOR PROMOTED BY MEANS OF THE ALLOTMENT SYSTEM.—At the recent meeting of the Lower Heyford (Oxon) Root Show, Mr. William Wing, of Steeple Aston, the father and founder of the show, adverted to the progress which sanitary measures had made in connection with these societies, and more especially with the allotment system, whereby the labourer gained an interest in the soil, was induced to cultivate it to the highest point, and by making the best of animal and vegetable manure, instead of allowing it to accumulate and to become not only useless but offensive, it was now by the process of nature, converted into a means of increasing the supply of food for mankind. In most other places, flowers were the primary, and roots the secondary object; but here it was reversed, as roots were their chief feature, and flowers were sup-

plementary or incidental to them. They had no permanent society nor fund, but relied on the spontaneous good-will of those around them; they assisted them in rewarding those who were engaged in the cultivation of the soil, without whom they should be but poor creatures, and the labourers had heartily responded to it; and when he stated that they had sent 80 different articles for exhibition, he thought it was the best proof that their efforts had been crowned with complete success. He did not say this with self-laudation, but with a feeling of deep gratitude to those who had aided him in carrying out his pet scheme.

ADULTERATION OF MANURES.

Sir,—In the address of Dr. Anderson to the Scotch Agricultural Society is the following statement:—

"A very remarkable instance of this occurred to me some time since. I analyzed a manure professing to be manufactured by a particular process, which it is unnecessary to explain; and calculating from the amount of its valuable matters I fixed its price at £1 5s. per ton; in doing which my estimation was based on the regular market prices of these substances, so that it was possible for any person, by mixing salts of ammonia, &c., to produce a manure of equal value for that price. Some time after, I met the individual for whom the analysis was made, and he informed me that he had shown it to an extensive dealer in manures, who had said that he had no doubt it was quite correct, but that he could himself afford to give for the manure a much higher price than I had fixed; because he knew that, in the present state of the market, he could sell it for £4 or £5 per ton. Here then was a person, prepared to speculate on the ignorance of the farmer, by inducing him to pay, for this substance, nearly three times its actual value. It is scarcely possible to adduce a more striking illustration of the risks to which the farmer is laid open by the want of chemical information."

If this is done to the keen and wealthy farmers of Scotland, what must be expected for small farmers where agriculture is in arrear!

It is a lamentable reflection that farmers, working early and late, should be preyed upon by a set of harpies, who thus swindle them out of their profits. Small farmers cannot be expected to study chemistry, as Dr. Anderson recommends. But now there is an official chemist, Dr. Voelcker, of Cirencester College, appointed by the West of England Agricultural Society, who will examine their manures at a very reasonable rate, they may agree among themselves to have a few well averaged samples assayed yearly, to detect these swindlers and drive them from the market—not sellers' samples, but drawn from different parts of their purchases, and well mixed, so as to form average samples of the whole. Let them reflect on being thus cheated of a bag of wheat, or a ton of turnips, per acre, year after year; and think how many assays this would pay for, and leave a good profit for their own pockets, instead of going for articles nominally cheap, but really little worth.

I. Prideaux.

Note.—Nor is the farmer the only sufferer. The country needs all that can be produced from its soil; and whatever is thus hindered by falsified manures is a national injury.

CALENDAR OF AGRICULTURE.

The crops of all kinds are now everywhere secured, and preparations commence for the labours of another year.

Gather and quarry stones for useful purposes; lay them for draining, which may now be very conveniently done on grass lands and stubbles. Fill the cavities as soon as dug, to prevent falling in.

Flood water-meadows; the main channels, conveying-gutters and flood-gates, must all be repaired, and put into proper order.

Cut underwoods, plant forest trees, open-drain plantations, make new fences and repair old ones, collect earths for composts, make and clean roads, and cast open ditches. This month is often very favourable for such purposes, before the winter floods and snows commence. Take up Swedish turnips in dry weather, dress the bulbs neatly, and lay them in store for winter and spring use. Raise also common turnips for a month's provision; they may not keep longer in fresh weather.

Regular thrashing will now be required to supply the yards with litter, and the cutters for chaff. Litter the yards evenly and often, lay them level, and spread over the surface the substances of different quality.

Feed work-horses with chaff of hay and straw, a portion of corn, with steamed roots (as potatoes and carrots) once a day, and best in the evening.

Attend to the feeding of cattle; give as much food as can be consumed, but not to nauseate, and to be finished daily before night. Look to a warm and dry bed. Give young cattle turnip-tops and ample littering, and to milch cows cabbages and tops, with hay or chaff.

The different sheep flocks require the same careful treatment; dry beds and shelter are essential, and near to the food the animals are eating. Folding may be done on dry lands and in warm climates: very generally the turnips must be carted, or the sheep run back on a dry field.

Young horses in a yard or paddock require much attention at this period of their growth. Give chaff and corn mixed, and potatoes or carrots, and provide soft food of some kind.

Feed pigs as before directed, with steamed potatoes mixed with meal and dry grains. Litter well, and keep the yards dry.

Lay dung and composts on grass lands and meadows during dry fresh weather.

Begin to plough stubbles, and follow with the subsoil plough. Continue as long as the weather will permit the fallowings for the early green crops of the next year.

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weat'r.
1855.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Sep. 21	30.27	30.28	52	72	58	N. N. W.	gentle	fine	sun	fine	dry
22	30.27	30.27	52	70	56	E. by N.	lively	fog	sun	fine	dry
23	30.27	30.33	51½	73	61	East	var.	fog	sun	fine	dry
24	30.44	30.44	58	63	49	N. East	brisk	cloudy	sun	fine	dry
25	30.44	30.34	47	62	49	E. by N.	lively	fine	sun	fine	dry
26	30.31	30.12	39	63	44	E. by N.	airy	fine	sun	fine	dry
27	30.04	29.83	37	69	62	S. and S. W.	airy	fine	sun	cloudy	dry
28	29.75	29.50	61	68	60	S. and S. W.	fresh	cloudy	fine	cloudy	showery
29	29.55	29.58	59	65	59	East	lively	fine	fine	cloudy	showery
30	29.60	29.43	57	65	56	East	lively	fine	fine	cloudy	showery
Oct. 1	29.51	29.54	52	66	52	S. West	lively	fine	sun	fine	dry
2	29.56	29.73	49	64	52	Westerly	gentle	cloudy	sun	fine	dry
3	29.73	29.60	46	62	59	S. or by E.	gentle	cloudy	cloudy	cloudy	rain
4	29.47	29.33	57	64	55	S. West	lively	cloudy	fine	clear	rain
5	29.41	29.40	52	67	55	S. West	brisk	cloudy	cloudy	clear	rain
6	29.39	29.37	51	65	57	South	lively	cloudy	sun	fine	rain
7	29.31	29.38	51	62	51	S. and S. W.	gentle	fine	fine	fine	dry
8	29.48	29.51	48	65	52	S. and S. W.	gentle	fine	sun	fine	dry
9	29.55	29.55	47	62	54	West	gentle	fine	sun	cloudy	dry
10	29.67	29.78	44	54	47	N. West	gentle	fine	sun	cloudy	rain
11	29.76	29.63	45	57	57	W. or by S.	strong	cloudy	sun	cloudy	rain
12	29.66	29.64	55	60	54	Variable	brisk	cloudy	sun	cloudy	rain
13	29.66	29.66	46	58	47	W. by S.	gentle	fine	sun	cloudy	dry
14	29.59	29.50	46	55	46	W. by S.	gentle	fine	sun	cloudy	dry
15	29.50	29.56	36	50	46	W. by S.	gentle	fine	fine	cloudy	rain
16	29.74	29.74	41	57	50	W. by S.	gentle	fine	cloudy	cloudy	rain
17	29.71	29.83	49	62	53	S. E. and E.	gentle	cloudy	fine	cloudy	rain
18	29.88	29.99	48	54	49	W. S. W.	gentle	cloudy	sun	clear	dry
19	30.05	30.12	48	57	50	W. by S.	gentle	fine	sun	clear	dry
20	30.20	30.20	48	59½	54	S. West	lively	fine	fine	fine	dry
21	30.16	30.16	53	59½	57	S. West	lively	fine	cloudy	cloudy	showery

Estimated Averages of October.

Barometer.		Thermometer.		
Highest	Lowest.	High.	Low.	Mean.
30.610	28.740	68	27	48.9

Real Average Temperature of the three Columns.

Highest.	Lowest.	Mean.
61.93	49.3	53.74

Weather and Phenomena.

Sept. 21 and 22.—Summer-like. 23.—Fog, cleared off at 10 a.m. 24.—Hints of drizzle. 25 and 26.—Lively air; brilliant. 27.—Change; cirrus clouds; sultry air. 28.—Shower in afternoon. 29.—Showers and fine intervals. 30.—A copious shower. Rain of the three days, half an inch and 7 cents.

Lunation.—Full Moon, 25th day, 9 h. 26 m. afternoon.

Oct. 1 and 2.—Fine days. 3.—Soaking drizzle. 4 and 5.—Changeable, with showers. 6.—Pretty fine. 7.—Superb sun-set. 8, 9, and 10.—Three charming days. 11.—Overcast and damp. 12.—Close; a shower. 13 and 14.—Fine. 15.—Fine till four p.m. 16.—Showery. 17.—The same. 18, 19, and 20.—Beautiful balmy temperature. 21.—Gloomy, overcast; a little shower at night.

Lunations.—Last quarter, 2nd day, 11 h. 4 m. night. New moon, 11th day, 3 h. 24 m. morning. First quarter, 18th day, 3 h. 38 m. afternoon.

Remarks connected with Agriculture.

In the course of this period fully two inches of rain have been registered by me. This supply, without rendering the ground poshy and intractable, has been most favourable to the roots. The mangolds have grown prodigiously, and will prove a vast supply. The turnip tribes improve daily, in consequence of the genial temperature, and grass lands become quite verdant. Murmurers may say what they please; but beyond any doubt, the great fact that two successive fine harvests have been perfectly secured remains unassailable.

J. Towers.

Croydon, Oct. 22.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR OCTOBER.

All out-door operations have been in active progress during this month, and it is gratifying to find that, notwithstanding the season has been a comparatively late one, an immense amount of work has been accomplished even in the most backward districts. The present high value of wheat, and the certain prospect that we shall have considerable firmness, perhaps activity, in our markets for a considerable period, have induced our farmers to lay down a much larger breadth of land for that grain than has been ever known, and the fineness of the weather has enabled them to get the seed in with comparative ease. Although the temperature has been by no means mild, the wheats have rapidly appeared above ground, and they now exhibit a good tilth.

As regards the produce of this year's crop of wheat, it is now pretty generally admitted that it is proving larger than was at one time anticipated. Of course, it is considerably less than in 1854; but all comparison with that year would be unfair, because in that season we grew the largest and best crop of wheat on record. The average of several previous years, however, proves that the new crop is far from small, notwithstanding that instances have been met with, in which the yield is beneath an average. Barley is turning out well as to quantity, but the colour of at least two-thirds of the entire crop is poor. Fine malting parcels must of necessity be very scarce during the winter and spring, and they will, no doubt, command high prices. At present it is difficult to purchase fine Chevalier qualities under 42s. per quarter.

We have nothing fresh to communicate in reference to the new crop of oats, beans, or peas. Their yield appears to be a tolerably good one. The loss of our usual imports of oats from Archangel—100,000 quarters—has had little or no effect upon the oat trade. It would appear that the increased produce of the crop in Ireland and Scotland has fully made good the falling off in the receipts from Russia.

A great difference of opinion continues to prevail respecting the future price of wheat, and the extent of our importations of that article from abroad. That the price will in a great measure be determined by the quantity of wheat and flour we shall be able to draw from the United States is very evident; but our impression is, that the resources of America have been greatly overrated, and one feature in the trade must exercise great influence upon value, viz., the great competition going on at New York between English and French exporters, who are likely, from purchases already made at a considerable advance in price, to keep up the present excitement on the other side of the Atlantic. That our own crop is wholly inadequate to meet consumption does not admit of a doubt; and that France requires between 2,000,000 and 3,000,000 quarters to meet actual necessities is equally certain. Lower prices here, therefore, can be hardly anticipated; in point of fact the prospects are decidedly more in favour of a rise than of a decline in the quotations. The continental markets—we refer more particularly to those in the Lower Baltic—are unusually high. Stores everywhere are trifling, and very few contracts have been made for forward delivery.

The potato crop in all parts of the United Kingdom, but more especially in Ireland and Scotland, is proving wonderfully large, and almost wholly free from disease. It is much to be regretted that so many reports of an opposite tendency should have found their way into print during the last two or three months. Whatever arguments may be advanced to the contrary, we affirm—and we do so advisedly, and after the most mature consideration—that the aggregate growth of potatoes is by far the largest and best ever known. This great fact will, no doubt, have considerable influence upon the value of other kinds of food.

The various cattle markets have been fairly supplied with stock as to number, but the weight and condition of both beasts and sheep have been miserably deficient. The trade generally has been far from active. Owing to the high value of money, and the difficulties in the way of obtaining discounts, the colonial wool sales now in progress in the metropolis are going off heavily, at a decline in price, compared with the previous series, of from 1d. to 2d. per lb. All English qualities are very dull, and may be purchased at ½d. per lb. less money. The wool market certainly wears a gloomy appearance.

The root crops are turning out well; but the quantity of hay on most farms is small, and worth a high price. Cakes have, in consequence, advanced to £14 per ton for the best English.

The whole of the hops have at length been secured, and the growth is enormous; indeed, some parties call the duty £350,000.

In Ireland and Scotland, most agricultural matters are in a very prosperous state. Prices of produce rule high, and large supplies will shortly find their way to England.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the cattle trade has not been to say brisk, it has ruled tolerably firm, and prices have been fairly supported. Complaints have been very general of the inferior condition in which both beasts and sheep have appeared on sale, not only in the Great Metropolitan Market, but likewise in the provinces; indeed a worse season for stock in this respect we scarcely ever remember: and we may further remark that our accounts from the northern grazing districts inform us that the supplies on hand are very deficient in weight. This is to be much regretted, because fat has now become a very scarce commodity, and the Baltic merchants are reaping enormous profits at the expense of the general community. Notwithstanding the increased taxation of the country, the consumption of meat appears to be increasing, and as there is no prospect of a falling off in it, we may pretty safely calculate upon prices ruling high for some time. In order to check the upward movement in the quotations in France, the Government of that country have imposed certain restrictions upon the sale of meat: but it is quite certain that no government by imposing restrictions can add to the supply. A high price adds to production and to the extent of the importations; so that it becomes a minor evil for the people to pay a high value for a short period, than present rates for a long one.

One of the most interesting portions of the supply of stock shown in London has been the arrival of nearly 2,000 beasts, and 4,000 sheep from Ireland, *viâ* Liverpool. These arrivals have been in first-rate condition, and sold readily at very full prices. We have been somewhat struck with the perfect symmetry of the beasts and the great weight of some of the sheep, nearly the whole of which were raised upon estates purchased in Ireland, by English proprietors. In some measure, they have been sent to London to shew us what Ireland really can do, and we congratulate their owners upon the success which has attended their efforts. A few more such enterprising parties in the sister island, and we shall not want for meat, enough and to spare; we shall not look upon it as a matter of serious moment whether we shall receive our accustomed supplies from Holland—we say serious, because France is still a large importer, much larger, in point of fact, than ourselves—and whether we shall have famine prices. Ireland, we know, is able to export double the present supply of stock; and here is a mine of wealth for her, only to be taken advantage of by the strict application of judgment and exertion. Apparently our northern graziers, when we consider the low condition in which they have forwarded their stock to the metropolis, have been badly off for good keep this year; but this is an evil that requires a counteraction. The prime value of butchers' meat must return a large profit to the grazier; and if he desires to keep pace with the times, it has become a matter of necessity for him to use a greater quantity of artificial food. But then it may be said that store stock is at a price which renders an excessive outlay dangerous—that we have cake now up to £14 per ton—and that every reasonable exertion has been made consistent with the strict principles of trade. All this may be very true; but it strikes us very forcibly that it would be more consistent if the immense sums transmitted week by week to Holland, to pay for cattle, were handed over to our own graziers. Another feature in the trade may be referred to, viz., the total cessation of all arivals from Scotland, and the fact that about 200 beasts have been purchased in London for transmission to Edinburgh, Perth and Dundee! We can only account for this singular turn in the trade to the large number of beasts now in the stalls in Scotland, and in course of preparation for Christmas consumption.

Very few complaints have reached us respecting the health of either beasts or sheep: but we regret to find that the quantity of hay on most farms is unusually small. However, the carrot and turnip crops are proving very abundant and of fine quality.

The arrivals of foreign stock have been rather extensive, as will be seen by the following return :—

IMPORTS OF FOREIGN STOCK INTO LONDON.

	Head.
Beasts	8,136
Sheep	21,137
Lambs	193
Calves	1,358
Pigs	1,501

IMPORTS AT CORRESPONDING PERIODS.

Sept.	Beasts.	Sheep.	Calves.	Pigs.
1854	6,894	16,328	1,009	1,063
1853	8,190	30,643	1,797	1,585
1852	7,792	26,072	1,350	1,624
1851	5,239	18,688	1,496	1,912
1850	5,929	20,982	1,312	1,702
1849	5,008	16,190	565	243
1848	2,962	10,669	803	116

The total numbers of English, Irish, and foreign stock, exhibited in the Great Metropolitan Market have been as under:—

	Head.
Beasts	24,666
Cows	490
Sheep	118,578
Calves	2,748
Pigs	3,558

COMPARISON OF SUPPLIES.

Oct.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1854	26,456	510	146,048	1,900	3,620
1853	27,327	545	145,400	2,517	3,112
1852	26,134	525	132,430	2,556	2,770
1851	22,092	450	119,050	1,999	3,470

From the Northern districts, during the past month, about 8,000 shorthorns have come to hand. The remainder of the supplies has been chiefly derived from Ireland and Holland.

Beef has sold at from 3s. 2d. to 5s.; mutton, 3s. 4d. to 5s.; veal, 3s. 6d. to 5s. 4d.; and pork, 3s. 10d. to 5s. 2d. per 8lb., to sink the offal.

COMPARISON OF PRICES.

	Oct. 1851.		Oct. 1852.	
	s. d.	s. d.	s. d.	s. d.
Beef.....from	2 6 to	3 8	2 0 to	3 10
Mutton.....	2 10	4 2	3 0	4 6
Veal.....	2 8	3 10	2 6	4 0
Pork.....	2 10	3 10	2 10	3 10

	Oct. 1853.		Oct. 1854.	
	s. d.	s. d.	s. d.	s. d.
Beef.....from	2 6 to	4 4	3 2 to	5 0
Mutton.....	2 8	5 0	3 2	5 0
Veal.....	3 6	4 10	3 0	4 8
Pork.....	3 6	4 10	3 4	5 0

There have been rather large supplies of both town and country-killed meat on sale in Newgate and Leadenhall, though in very inferior condition. The trade generally has ruled heavy, at drooping currencies. Beef, from 3s. to 4s. 6d.; mutton, 3s. 2d. to 4s. 6d.; veal, 3s. 6d. to 4s. 8d.; pork, 3s. 10d. to 5s. 4d. per 8lbs. by the carcase.

LEICESTERSHIRE.

Atmospheric changes having great influence upon agricultural practice, we cannot refrain from reverting to the splendid September harvest which we had this season. In the whole of that month there fell in this locality rain in three days amounting to only 0.70 of an inch, the temperature ruling high with hot sunny days; whereas up to the 17th of this month we registered 2.43 inches. This fine weather in September was a fortunate circumstance; for such was the character of many crops of grain, that had much rain fallen at that period they would have rotted on the ground, and the produce would be utterly unfit for human food. Many fields, where a full crop, were beaten down by a violent storm which visited this locality on the 7th of July, and they were greatly damaged in consequence, and the sample proves thin and light; but such were the salutary effects of a hot and dry September, that this grain was secured in excellent condition, and a sprouted ear was scarcely discovered in the fullest and most laid crops. Such being the case, though the produce of these crops will be inferior in quality, yet it is all fit to make good sound bread, though of a coarser kind than usual. The flour now made from wheat consists generally of three sorts, 1st., 2nds., and 3rds.; the latter being used by large consumers. We cannot refrain from remarking that when so many samples are thin and yielding a larger portion of bran to the flour than in most seasons, it would be good policy to introduce a coarser kind of wheat flour which might be called 4ths., by not dressing out so much bran; such bread would be of a darker colour, but not less wholesome as human food. It is a well-known fact that such a quality of bread is recommended by medical men as more conducive to health, than that made of the finest flour; and it is frequently introduced and eaten in noblemen's and gentlemen's families, as well as at the first hotels in the kingdom. This course is not urged from an impression of a deficiency of food in this country, but merely on the score of economy; as such bread would come at a less price than that now generally eaten by the labouring classes, which is a great consideration in these dear times. Nearly a month having passed since the completion of harvest, we should be in a position to judge more accurately of its probable yield. The accounts, we hear, are conflicting; and this is natural when the crops vary so much in bulk and quality of grain. In estimating the produce of the last harvest, we must take into consideration the difference of weight and measure, and we are of opinion that it will vary to the extent of 10 per cent. between the produce of the laid crops and those which were standing. The yield of the corn already thrashed will not warrant us in arriving at any definite conclusion as to the final result, as the chief of that brought to market has been of the better quality, the demand being great for seed corn, and it would be the worst policy to use thin corn for that purpose. From the best estimate we can at present make, we believe, in this neighbourhood, the wheat will give nearly an average produce in measure; but a considerable portion of it will be less by weight, probably amounting to 10 per cent., and consequently yield below an average quantity of food, but not to any great extent. The barley crops were heavy, and gathered in good condition; and though the quality is not first-rate, we believe the produce will prove considerably over an average. Much of this grain will be thin and light, as the crops were laid; the proportion of light corn will therefore be great, but this will come in well as food for stock in the winter, being a substitute for cake, which is now very dear. Oats were a fair crop, and the yield will no doubt be a full average. Beans will not be equally productive, as the winter variety was a general failure. All kinds of corn are rising in price—wheat, 80s. to 86s.; barley, 38s. to 44s.; oats from 32s. to 38s.; beans, 50s. to 56s. per quarter. The potato crop we never recollect finer; the produce is large and quality good, except in those situations where attacked by disease, but this is less general than for many years past. Turnips are not good; the swedes being much affected by mildew and otherwise diseased, but those which have escaped these disasters have much improved by the late rains. The common turnips are better, and the mangold is good in quality, but not a heavy crop. We are glad to observe that the breadth cultivated of this invaluable root is greater this year than in former seasons. The pastures have been much improved by the rain and mild temperature, and they now yield plenty of keep for sheep. Stock of all kinds are generally healthy and are doing well; but feeding beasts have not arrived at their usual state of fatness, from the scanty supply of grass through the summer, and many come to market in middling condition. The best quality of beef is making 7d. per lb., the inferior a much lower price. Mutton comes to market in fair condition and quantity, the best making the same as beef. All store stock sells well, and the best quality at high figures. The fine weather in September gave every opportunity for cleaning the stubble ground and working the fallows, and the land was in a forward state to receive the autumnal seed. The late rains have yielded a supply of water where greatly needed, and brought the land into a fine tilth, only interrupting the sowing for a few days, and a large breadth is already in the ground with every prospect of the best results. The wool trade has been inactive of late, and buyers are using great caution; but the price remains about the same, as farmers refuse to sell at any reduction. Our labourers are all well employed, and the wages rule generally 12s. per week.—Oct. 25th.

SOUTH LINCOLNSHIRE.

We have never been called upon to report a more favourable season than the present. The harvest was splendid, but the weather for the past month has been in every respect all that the farmers could desire. Autumn culture has been universally adopted, and this year it has been carried out to an unexampled extent. Wherever the eye is turned, a Bentall, Biddell, Coleman, or other scarifier or cultivator is in full requisition, and every man and horse is fully engaged in the various cleansing processes of the soil which the judgment of the farmer can devise. The thing is no longer limited in its application; it is general—it is seen everywhere, either for purposes of cleansing or of aëration, &c. Who can now disparage a farmer's efforts, and tauntingly remind him of his bounden duty to do his utmost to provide food for the growing wants of the community? Thanks to an intelligent press and an improved agriculture, we need the spur no longer; the farming mind is broad awake, and only waiting for further developments of agricultural progress and mechanical advancement. It is wholly incalculable to what extent our culture might have attained in this admirable season, could steam appliances have been brought into general use in aid of animal power. We hope very soon to see it. The wheat-sowing in this district is proceeding most satisfactorily, and much attention is given to obtain the most profitable varieties for seeding. The fine season has caused the pastures to assume a new summers' dress, and the acquisition of so much good grass is quite a relief frem the dismal forebodings of last month. The turnip crop too has commenced its autumn growth, and the mildewed crops named in our last report have resumed their greenness. The cloverseed crops, however, are past recovery, and fail rapidly; none but those of late growth retain their leaves. Some of our farmers are securing the mangold crop. Potatoes turn out well, and are nearly free from disease. The high price of grain causes a corresponding price in potatoes; otherwise they would have fallen to their ordinary level of past years prior to the disease. We still continue to hear of defective produce in the wheat crop, and our own experience bears testimony to the truth. All are bad except good strong loams or well-farmed clays. Oats prove equally deficient. Grazing stock have progressed favourably, and this universally fine autumn has caused us to look with less apprehension to the approach of winter. Good store cattle and sheep have consequently improved in price; lean and unconditioned animals are almost unsaleable. The farm labourers are fully employed, and some complaints are made of a scarcity of hands. Wages keep up equitably; men 2s. 6d., women 1s. 3d., lads 6d. to 1s. 6d. per day; hours of labour, from 7 o'clock A.M. to 5 o'clock P.M. It is very gratifying to find our farmers willing to share a portion of their gains with their labourers. At this season it is customary to reduce wages according to the hours of labour; in this district the alteration in time took place last week, but the wages remain the same.—Oct. 27.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASHBOURN FAIR.—A good show of horses; the best colts and foals were sold, and realized great prices. We heard of foals fetching more than £20 each. The show of cattle was not so large as we have had on previous occasions. Fresh barren and good incalvers were easily disposed of, especially the latter, which made a great deal of money. Good fat beasts were in request. In the sheep fair there was a good number of sheep penned. Stores of all descriptions were flat sale, ewes in particular; fat ones were also lower in price. This being the fair for the show of rams, there were several of our breeders who showed some very good ones. There were not so many as at former fairs. Sales were brisk, and the best were disposed of at good prices; we believe as much as £15 were realized. Beef made about 6d.; sheep, 6½d.

BLYTH FAIR.—A tolerably good supply of beasts, some of which fetched fair prices. The sale of the leaner kind was heavy, and several were not disposed of at a late hour. Sheep were plentiful. Some very good lambing ewes reached from 37s. to 40s. per head. Of lambs the greater part were only in moderate condition. The show of horses had not improved upon former fairs. Good horses, as usual, fetched high prices. The supply of pigs was good—some of first-rate quality—and sold at remunerative prices.

BRIDLINGTON FAIR.—An unusually large supply of cattle, a quantity of which was sold, there being a large attendance of farmers and jobbers. Lean beasts were in good request, and fat ones sold readily at from 7s. 6d. to 8s. per stone. The quality of the horses exhibited was better than those previously shown.

COLCHESTER FAIR was particularly fine in the show of bullocks—the largest that was ever recollected to have been held here. There were calculated to be between 900 and 1000 bullocks, and 400 or 500 horses. Of the latter, Mr. Martin, of Cattawade, showed over 50 cart-horses and colts, 30 of which were sold; good cart-horses realizing from £40 to £45, and colts from £35 to £40. Mr. Keys, of Heybridge, exhibited 23 two, three, and four-year-old cart colts and horses, averaging from £30 to £40 each, nearly all of which sold. Mr. Roofe, of Colchester, showed 13 cart colts and several cart-horses, with two extraordinary yearlings. The two-year-old colts sold at £40 and £43, and a yearling at £33. Mr. Fenner, of Colchester, brought a drove of 62 Welsh ponies, most of which sold at from £6 to £14; also nearly 300 beasts, North Welsh about £6, and runts £9. Of the beasts, the principal exhibitors were Messrs. C. Page, Munnings, G. Simpson, Burrell, Freeman, S. Johnson, Everett, Lowe, and Fenner. Polled Scots ranged from 10 to 13 guineas; North Welsh runts from £6 to 10 guineas; Herefords, from £8 to £15; South Welsh, from £5 to £9; Shorthorns, from £8 to £14, many lots of which sold. A few pens of sheep, the best of which was a very fine pen of three-year-old Hampshire Downs, averaging about 44s. per head, exhibited by Mr. Robert Johnson, of Myland. There was a large attendance of farmers and dealers. On the whole prices ruled high, and there was considerable business transacted.

DEVIZES FAIR.—The pens exhibited an excellent choice of sheep—most of them to be had at a moderate figure—at something more than 1s. per head below the prices obtained at Weyhill. Except for prime lots, business was very heavy, and a considerable number of sheep were driven home unsold. Upwards of 20,000 sheep and lambs were penned.

EARLSTOUN FAIR.—There was an average show of cattle. The better qualities were in short supply, and sold at prices fully equal to recent markets. There was a considerable number of stirks shown for wintering, and the best kinds sold readily from £9 to £11; inferior, a great many of which would be left unsold, may be quoted from £5 to £7. The number of cattle shown was 1,414. In the horse market there were a great many young horses shown. Colts and fillies of the best description were selling from £30 to £35. Those of an inferior description were a bad sale, and a great many unsold.

GAINSBOROUGH FAIR.—There was an excess of live stock and of sheep, but prices were, nevertheless, higher than had been anticipated. Of the horse fair it is needless to say more than that the show was of the lowest description, and the number offered for sale very small.

HAWICK FAIR was numerously attended. The show of horses was considerable, chiefly draught colts and fillies. There were also several lots of Shetland stirks and kyloes. The chief business was done in the horses, for which there was a great demand, and though prices ranged high, many were sold. Horses rising two year old from £16 to £25. Colts and fillies rising three year old from £30 to £42. Aged and seasoned animals at all prices from £12 to £35. Ponies rising three year old from £10 to £15. Draught foals £9 to £12. Stirks £7 to £10. Kyloes £4 10s. to £7.

HEREFORD FAIR.—The show of beasts was almost exclusively of the Hereford breed, and a finer collection of animals was perhaps never brought together. In number probably the show was not equal to some former fairs, on

account of the great draughts that have latterly been made on the stock by dealers who have gone through the county for the purpose of buying up animals of this favourite breed. Sales commenced briskly at an early hour in the morning, and prices ran very high, two and three-year-old beasts fetching £4 to £5 more money than at last year's October fair; £21 to £26 was about the value of a good-conditioned beast, and some choice lots were bought for his Royal Highness Prince Albert at superior rates. The sheep market was of little comparative account. Horses were in pretty good supply, and high prices were asked and obtained for all descriptions of nags. Pigs were hardly so dear as of late, and 10s. per score was about the average value.

LOCKERBY OCTOBER FAIR.—There was a very large show of white stock, by much the greatest which has ever been seen here in October, numbering from 15,000 to 16,000 head of ewes and lambs. The show of cattle was moderate, comprising a few hundred animals; there were several lots of good wintering cattle and a considerable number of inferior quality; the show of Highlanders was small. The numbers of sheep were much in excess of the buyers, and the market was exceedingly dull throughout, nearly one-half of the stock being driven off unsold, and many of the lots without receiving a bid. Certainly those who chose to run the chance of a favourable spring of 1856, or had not filled up their stocks, must have made advantageous purchases on Thursday. For good cattle there was a tolerable demand, and most of these were sold at prices a shade lower than those current at Dumfries the previous day. Inferior kinds were not by any means readily sold, though black stock maintained their value upon the whole much more firmly than white.

MARKET HARBOROUGH FAIR.—The supply of horses was good, and met with a ready sale. Fat beasts were quickly disposed of, but in store beasts little business was done.

MELTON FAIR was very fully attended, the supply of beasts being both great and good. Sheep were not quite so abundant, and horses rather less so, but a brisk amount of business was done, and prices generally were well sustained.

MUIR OF ORD MARKET.—The want of wintering for cattle materially increased the number driven to market, and at the same time checked the demand for them in a corresponding degree; while the result of the Falkirk market showed that the south did not present so advantageous field for speculators. For at least six years and probably for a great deal longer, there has been no such exhibition of stock at Muir of Ord as was witnessed on Wednesday. At a market of this description—where buyers had a wide choice, and sellers were anxious to dispose of their stock—it was natural to expect that prices would not start very high, and that they would accordingly fall as the day advanced. This was the case; it was a dull stiff market, and though a great deal of stock was sold, fully one-half the cattle and three-fourths of the sheep brought there were unsold when darkness was coming on. In many instances the prices offered on Thursday afternoon were considerably below those tendered the previous day. The best cattle on the ground were picked up early in the day, and for the most part at rates not inferior to those of the previous markets this year. For all others the demand was dull, and the supply so large that a fall of fully 10 per cent. took place, and as we have stated above, even at this reduction the number of sales was small in comparison with the quantity of stock exhibited. Good crosses, two years old, fetched from 12*l.* to 16*l.* a-head.

PARTNEY FAIR was unusually large. Young steers and heifers sold well, as did also fat beasts, of which there was a good show. Twenty two-year-olds, the property of Mr. Higgins, fetched 21*l.* 10s. each. The best beasts made 7s. to 7s. 6d. per stone.

SALISBURY FAIR was numerously attended; trade was very dull, and many things were driven away unsold; beef brought from 10s. to 11s. per score.

SLEAFORD FAIR.—There was a plentiful supply of stock, and a moderate amount of business was done, but it was considered that the attendance of visitors was not so numerous as last year.

ROTHERFIELD FAIR.—A great deal of stock was brought to market, the best of which went off at good prices, but the lean and bad hardly found purchasers at any price. A good clearance was effected of Welsh runts.

RUGBY FAIR was well supplied with every kind of sheep. The beef sold from 6d. to 6½d. Mutton was rather dull of sale, and brought from 6d. to 7d. per lb. for the best qualities. Milking cows were dear, and in short supply. Store beast brought large prices. The fair was what is termed a hanging fair, and stock moved off heavily.

SHIPSTON-ON-STOUR FAIR.—There was a numerous attendance of dealers, with a large quantity of stock of every sort, exhibited for sale. Beef and mutton were sold at higher prices, those articles of consumption realizing quite 7d. per lb. There was a large number of sheep penned in the streets for sale, which met with ready purchasers, at high prices. The horse fair was also well supplied, there being a number of Welsh colts for sale, some of which fetched good prices.

ST. AUSTELL FAIR was but thinly attended, and business was very dull. High prices were demanded.

STOW-ON-THE-WOLD FAIR.—The horse fair, as usual, was particularly good, and well supplied, there being from 1,500 to 2,000 horses in the fair, and a brisk trade was carried on. Cart horses were very good, and found a ready sale, at good prices. The supply of sheep was large and of good quality; mutton averaged 7d. per lb. The cattle fair was well supplied with stock of all kinds; beef averaged 7d. per lb. Pigs were scarce and very dear.

WINCHESTER FAIR.—There was a large number of sheep penned on Tuesday (about 10,000 above the average), and there were but few buyers; consequently, what business was done was at prices from 2s. to 3s. per head under those which ruled at Weyhill, west country dealers preferring to sacrifice, instead of driving their flocks home again: stock ewes in some cases fetched as high as 42s. per head. In the horse fair on Wednesday there were but few good animals. Such as were worth anything soon changed hands. In neat cattle there were some good young working steers, which sold readily. The remainder were principally yearlings, and of no great account. There was a large supply of pigs, and for these prices were lower, especially for fatted ones, the highest price being 11s. 3d. per score.

IRISH FAIRS. — GREAT OCTOBER FAIR OF TUAM: It is calculated that the supply of sheep amounted to upwards of 25,000. The sales were generally brisk and remunerative; every lot in good condition was bought up with avidity, and although heavy rain fell throughout the morning, still a stirring business was carried on from the opening of the fair. Heggets ranged from 43s. down to 33s. Two-year-old wethers fetched up to 46s., and ewes of good breeding sold very well. The fair, on the whole, is considered to have been a good one, and several sellers felicitate themselves on their having passed by Ballinasloe and kept their lots for this fair, which is now fully established as one of the most important in this country next to Ballinasloe. Nothing was left unsold but the inferior description of stock. Cattle: There never was seen a larger supply collected upon the green than on this occasion. Fat cows ranged from 14*l.* to 21*l.* and 23*l.* The chief demand was for stores of a good quality, and these were readily bought up. The supply was very great, and the demand, generally speaking, was equally good. Sellers are, on the whole, well remunerated, though their expectations may have gone higher than the realization; inferior stock was, as a matter of course, rather a drug in the market; but stores in any sort of condition were readily bought up. The numbers reached to nearly 8,000, out of which a very large proportion changed owners. NEVAN, Oct. 22: This fair was most extensively supplied with stock. Beef sold from 58s. to 60s. per cwt.; stores from 13*l.* to 15*l.* each; springers 16*l.* to 22*l.* each, and young stock met a ready sale at advancing prices. In the sheep fair there was a large supply of stores, fat ewes, and wethers, which met a ready sale at best prices; grass lambs were also well represented. The horse fair contained few, if any, animals of note; long tails were in abundance, as also harness and useful agricultural nags; they all sold well, the demand being brisk. The pig fair, as is usually the case at Navan, was large, and the demand exceedingly brisk, particularly for bacon, which may be quoted at from 55s. to 58s. per cwt. GREAT MUNSTER FAIR, (Thursday): This was the first day of the great Munster Fair. There was a fair show of prime horses; two and-a-half years' old brought 25*l.* to 30*l.*, three years' old 35*l.* to 40*l.* There was a good supply of pigs, and a brisk demand; the average price, 46s. to 58s. per cwt.

GAINSBOROUGH CHEESE MART.—There was a good show of Cheese, and the prices of Trent-side ranged very high, some of the best being sold for 78s. to 80s. per cwt.

WHITBY CHEESE FAIR.—The number of dairies shown was less than at any former fair. Many buyers were present from York, Scarbro', Malton, Pickering, and other places, so that all was bought up before noon. From 69s. down to 60s. was the price obtained, the average settled by the trade being 64s.

GLASGOW, (Thursday last.)—There was a good supply of Cheese at market (viz., 8 carts), which sold at full rates. Prices: Old, 60s. to 68s. per cwt.; new, 53s. to 57s. per cwt.; skim milk cheese, 25s. to 27s. per cwt.

COUNTRY POTATO MARKETS.—YORK, October 20: A good supply of Potatoes of excellent quality, at from 8d. to 9d. per peck—2s. to 2s. 3d. per bushel. LEEDS, Oct. 23: A moderate supply of Potatoes sold at from 8d. to 9d. per 21lbs. wholesale, and 10d. retail. MALTON, Oct. 20: A fair show of Potatoes sold at from 6d. to 8d. SHEFFIELD, Oct. 23: A fair supply of Potatoes sold at from 8s. to 10s. 6d. per 18 st. RICHMOND, Oct. 20: Potatoes 2s. 8d. per bushel.

ENGLISH WOOL MARKET.

THIS DAY.—Owing to the heaviness at the Colonial wool-sales now in progress, and the high value of money, our market is very dull, and to effect sales of any kind of home-grown wool a decline of fully 0½d. per lb. must be submitted to. The supply on offer is tolerably large.

	s.	d.		s.	d.
Down tegs	1	0	to	1	1½
Do. ewes	0	11	—	1	0½
Half-bred hoggets	0	11	—	1	1
Do. wethers	0	11	—	1	0
Kent fleeces, mixed	1	0	—	1	1
Leicester fleeces	0	11	—	1	0
Combing skins	0	10	—	1	1
Flannel wool	1	0	—	1	2
Blanket wool	0	8	—	1	0

BRADFORD WOOL MARKET, Oct. 25.—Wool continued in very fair supply, and the staplers evinced an increased desire to move off combing qualities; this could not be done to any extent, the prices restricting business to quantities required for immediate use, and to effect sales lower figures had to be submitted to; in fact, the general tone of business was very quiet, with a slight downward tendency. Short descriptions of wool did not meet with so steady a sale as that for some time past experienced, and in consequence lower prices were accepted.

LEEDS WOOL MARKET, Oct. 26.—There has not been any material change in this branch of business during the present week. Sales have been small, and limited to a supply of the immediate requirements of the manufacturers. In prices the tendency is in favour of the buyers; but the reduction from recent sales is not considerable.

LIVERPOOL WOOL MARKETS, OCT. 27.

SCOTCH WOOL.—There is a fair demand for Laid Highland, but the stringency in money matters induces buyers to act with caution, and only take for their immediate wants. The above remarks are applicable to the White Highland as well as Cheviot and Crossed.

	s.	d.		s.	d.
Laid Highland Wool, per 24lbs.	9	0	*to*	9	9
White Highland do.	12	0		13	0
Laid Crossed do..unwashed	12	0		13	0
Do. do..washed	13	0		14	0
Laid Cheviot do..unwashed	14	0		15	0
Do. do..washed	16	9		18	6
White Cheviot do. do	24	0		26	0

FOREIGN WOOL.—The attention of the trade is taken up with the sales now in progress in London, particularly for fine Wools. There is a fair inquiry here, and moderate business doing in Low and Middle class Wools by private sale—a proof that the trade hold very light stocks, and require to buy for immediate consumption.

GERMAN WOOL REPORT.—BERLIN, Oct. 22, 1855.—The public wool sale, which took place here on the 18th inst., consisted of about 2,500 cwt. The attendance of buyers was not very large. Amongst those present, we observed (beside our own staplers) some inland cloth manufacturers, a Swede, a Belgian agent, an inland comber, and a few others. A public wool sale in Berlin being new, and its being preceded by so short a notice, to some extent accounted for the comparatively small attendance. The wool offered for sale consisted mostly of Russian and Polish fleeces, including scoured Odessa; and with the exception of the latter, there was nothing suitable for the English market. The greater part of the wools sold "out and out," and fetched market prices. The following are the prices paid:—Scoured Odessa at 80 to 70 rix dollars per cwt.; Russian common washed fleeces, 58 to 63 ditto; Polish fleeces (Dominicans), 64 to 74 ditto; lambs' (low and bad-conditioned), 58 to 74½ ditto; locks, 54½ ditto; Herbling's wools, 64 ditto; low country fleeces, 45½ ditto. Another similar auction will be held soon after the next Frankfort fair, but a larger quantity of wool will be offered. The wool trade in general has been rather flatter during the last fortnight. The public sale brought several buyers into the market, who purchased also in the warehouses. Prices are here not much changed, but wool is a little easier to buy. Good qualities of fleeces have been most in demand. Our inland cloth manufacturers are well employed for the American trade. Our stock of wool is very large, and will be still further increased by the arrivals of Russian (mostly scoured Odessa) wools, which, it is expected, will come in large quantities into this market.—*Leeds Mercury.*

SALE OF SHORT-HORNS, AT SIZERGH CASTLE.

The sale of short-horned cattle, &c., the property of Mr. Ellison, so well-known as an agriculturist and breeder of stock, took place on Thursday last, at Sizergh. Mr. Strafford, of high repute as an auctioneer of stock, officiated on the occasion, and, as might be expected, the sale drew together a large assemblage of *connoisseurs* in breeding both from far and near. We subjoin from the catalogue a list of some of the cattle, with the prices they fetched:—

COWS AND HEIFERS.	Guineas.
Princess III., calved in 1849. Purchased by Mr. Dudding	35
Blossom I., calved in 1849. Mr. Thornton, Ireland	36
Juno, a twin, calved in 1849. Mr. Young, Scotland	52
Eliza II., calved in 1850. Mr. Young, Scotland	100
Lady Love, calved in 1850. Mr. Thornton, Ireland	37
Rosamond II., calved in 1850. Capt. Gunter, Brompton	50
Ruby Rose II., calved in 1851. Mr. G. A. Gelderd, Aikrigg End, Kendal	42
Lavinia, calved in 1851. Mr. Verner, Ireland	50
Emma VII., calved in 1851. Mr. Norman	44
Rosabelle, calved in 1852. Mr. Thornton, Ireland	47
Leopardy II., calved in 1852. Mr. Bell, Wales	36
Lady Margaretta, calved in 1852. Mr. Young, Scotland	40
Eliza III., calved in 1852. Mr. Verner, Ireland	72
Juno II., calved in 1852 Mr. C. L. Ellison, Ireland	49
Nevosa II., calved in 1852. Mr. Young	50
Ruby Rose III., calved in 1854. Mr. Gelderd, Patterdale	47
BULLS.	
Mavrocordato, calved in 1853. Mr. C. L. Ellison	60
New Year's Gift, calved in 1855. Mr. Alison	54

HORSES.

The farm horses realised prices as follows:—Grey horse, 37 guineas; bay horse, 39; brown filly, 27; black colt, 25; grey filly, 19; grey mare, 19; brown colt, 20; black horse, 15; grey pony, 7 guineas.

The total of the sale was—	£	s.	d.
Cows, heifers, and calves	1562	8	0
Bulls	364	7	0
Horses	227	17	0
Total	£2154	12	0

We need hardly say that Mr. Ellison's well-known hospitality was largely exercised on this occasion for the entertainment of the concourse of friends and visitors—not less than 1000, we should suppose, being present.—*Abridged from the Westmoreland Gazette.*

REVIEW OF THE CORN TRADE

DURING THE MONTH OF OCTOBER.

There has been much activity in every branch of the trade throughout the month of October, and prices have steadily improved. Although the demand has been principally confined to purchases for consumption (the high prices preventing speculators coming into the market), sales of wheat for France were well kept up during the first fortnight, slackened the third week, and fell off towards the close of the month, the pressure in the money market at Paris having had more effect on the trade in France than that in London has had on the English markets. The corn trade with us never stood in a better position to meet any emergency of this kind, from these large transactions having universally since harvest been entered into for cash payment; there are, in consequence, few bills afloat under discount in this branch of commerce; therefore, however high the rate may be raised by the directors of the Bank of England, it will have little, if any, effect on prices, the operation being to check the exportation of gold, and not the importation of grain.

The supply of English wheat at the first Monday's market of the month, in Mark-lane, was moderate from Essex and Kent, and there was a steady demand for all good qualities at the prices of the previous week: the top quotation of red was 81s. per qr., and of white 86s. per qr. Full prices were paid for all descriptions of foreign wheat, with a good steady sale; the finest Dantzic commanded 94s. per qr., and choice qualities of Pomeranian red realized 84s. per qr.; all other sorts in proportion. The imports were to a moderate extent, consisting of 700 qrs. from Christiana, 2,310 qrs. from Dantzic, and 2,970 qrs. from Flushing. So unusual a quantity from the last small port requires a little explanation: It consists of cargoes coming from the Black Sea; and the vessels are bound to call at some port, to obtain *naturalization*, before they can come to England, and a near port was in this instance selected. From Konigsberg there were 710 qrs., from Tarsus 1,250 qrs., and coastwise 550 qrs.—making a total of 8,930 qrs., against 8,340 qrs. the corresponding week of last year. The London average registered 80s. 8d. on 4,812 qrs.; the weekly general average was 77s. 3d. on 146,137 qrs., against 55s. 9d. on 113,557 qrs. the corresponding week of last year.

The difference in the average at these two periods was thus 21s. 6d. per qr., the experience of last year not having been thrown away; and immediately after harvest there has not been such a rush to send down prices at the same rapid rate as resulted therefrom last season.

The quantity of English wheat brought forward at Mark-lane the second Monday of the month was still moderate, and new samples met a steady sale at the currency of the previous week for all useful qualities. A good deal of inferior quality appeared at this market in poor condition, and this sold slowly; but the dampness of new caused a better demand for all fine descriptions of old, for which high prices were paid. There was a good inquiry for foreign wheat at previous quotations, and the prices paid were precisely the same as the previous week.

The importations were of a trivial character, consisting of 1,630 qrs. from Christiansand, 700 qrs. from Morick, 460 qrs. from New York (the first of the season), and 700 qrs. from Seville—making a total of 3,490 qrs., against 2,385 qrs. the corresponding week of last year. The London average registered 80s. 8d. on 7,395 qrs.; the weekly average registered 76s. 6d. on 155,921 qrs., against 56s. 7d. on 151,801 qrs. the corresponding week of last year—the difference being 19s. 9d. per qr.; and this difference will be less from week to week, until the prices of the two years approximate to each other, the advance from this month last year being very rapid.

The third Monday in the month, there was a short supply of wheat from Essex and Kent at Mark-lane, and a good demand was experienced for all descriptions at an advance of 2s. per qr., samples adapted for seed being in brisk request; and approved sorts commanded high prices, both from our own and French buyers, whilst parcels of old were sold readily at 1s. to 2s. per qr. more money. The demand for foreign wheat was tolerably good, at an enhancement in value of 1s. to 2s. per qr. The imports were still very moderate, and consisted of 1,920 qrs. from Alexandria, 800 qrs. from Antwerp, 1,360 qrs. from Dantzic, 1,400 qrs. from Flushing, 18 qrs. from Mogadore, and 4 qrs. from Struer—making a total of 5,502 qrs., against 1,345 qrs. the corresponding week of last year. The London average registered 80s. 3d. on 7,830 qrs.; the general weekly average was 76s.

7d. on 152,443 qrs., against 57s. on 151,870 quarters the corresponding week of last year. The difference in price was 19s. 7d.; but in quantity very trifling, only 573 qrs. Many parties infer, because the deliveries this year are fully up to or rather over those of last year, that the yield must be as good. But not so: this arises from a greater number of buyers and sellers having been compelled to make returns, who, until within the last few months, never made any returns at all.

A fair supply of new wheat was brought forward from Essex and Kent at the fourth Monday's market in Mark-lane; and from the excited state of the trade throughout the past week in every town of the United Kingdom, the factors asked exorbitant prices at the opening of the market, and, as is often the case under similar circumstances, the demand was checked, and a very moderate extent of business was transacted, and that only at an advance of 2s. per qr. The French demand had also nearly ceased, as but few seed samples were required; a great portion of this day's supply was left over unsold for future markets. Foreign wheat realized 2s. per qr. more money, with a steady sale. The stocks of this description are much reduced, and there is now a poor chance of quality offering. The imports were still moderate, consisting of 5,420 qrs. from Alexandria, 2,820 qrs. from Dantzic, 64 qrs. from Hambro', and 21 qrs. from Tonning—making a total of 8,325 qrs., against 6,065 qrs. the corresponding week of last year. The exports amounted to 2,213 qrs. The London average registered 79s. 11d. on 6,875 qrs.; the general weekly average was 76s. 10d. on 144,870 qrs., against 57s. 6d. on 150,277 qrs. the corresponding week of last year. The top quotation of English red wheat was 84s., of white 90s. per qr., choice seed qualities commanding over these prices. The finest Dantzic was worth 98s., and prime Pomeranian red 85s. per qr. Although Egyptian Wheat has arrived in the greatest proportion, our town millers will scarcely use it. The best Saide white is held at 60s. per qr. over the ship's side, and may be taken for coarse breadstuffs for the interior when buyers can be found.

Considerable fluctuations in the value of flour have taken place throughout the month, and Norfolks (or, as they are well known under the appellation of, "Norwich Consols") have changed faster and oftener than any other. The top price of town-made was 72s. per sack the first week; Norfolks brought 59s. The arrivals coastwise were 2,469 sacks, by the Eastern Counties railway 9,279 sacks, by the Great Northern 2,237 sacks, from Scotland 40 sacks, from foreign ports 2,739 sacks; making a total of 16,764 sacks: and there were also 5,343 brls. of foreign. The second week prices were well supported. Norfolks realized about 6d. per sack more money, being saleable at 59s. 6d. The arrivals coastwise were only 592 sacks; but by the Eastern Counties there were 10,749 sacks, by the Great Northern 2,922 sacks, and from foreign ports 2,142 sacks and 4,164 brls. There was a firmness in the trade for all sorts at the third Monday's market, and Norfolks were generally held at 60s. per sack. Spanish samples have been placed readily, and commanded 65s. per sack: many of this description have been taken for France in the early part of the month; but this demand has fallen off, and has almost ceased. The arrivals the fourth week were 2,207 sacks coastwise, 11,663 sacks by the Eastern Counties railway, 3,174 sacks by the Great Northern, but only 274 sacks from foreign ports; making a total of 17,318 sacks. The top price of town-made was put up 3s. per sack, being now 75s. Households advanced to 68s., number two's to 64s. and 65s. Country marks of every description were 2s. per sack higher. Norfolks were held at 63s., and 62s. generally bid. Fine Spanish samples were saleable at 67s. per sack, with much firmness in the trade generally. Before the week closed there were sellers of Norfolks at 60s. per sack, to keep up their character of Norwich Consols.

The month opened with advancing rates for the best qualities of malting barley, distillers and maltsters being competitors for the same description. The best samples were 1s. per qr. dearer at Mark-lane the first Monday of the month, the top quotation being 42s. per qr. The arrivals of all sorts were very limited; consisting of 878 qrs. coastwise, 631 qrs. by the Eastern Counties railway, 98 qrs. by the Great Northern, 12 qrs. from Scotland, and 50 qrs. from Ireland; making a total of only 1,669 qrs. Trade was very firm the second Monday of the month, and the primest qualities of Chevalier realized 44s. per qr. The arrivals coastwise were 834 qrs., by the Eastern Counties railway 746 qrs., by the Great Northern 92 qrs., from Scotland 27 qrs., and 480 qrs. from foreign ports; making a total of 2,179 qrs. An increased quantity was brought forward the third Monday of the month. Fine samples were quite as dear, and in good request; but intermediate qualities were taken slowly, and about 1s. per qr. cheaper, grinding samples supporting prices. The arrivals coastwise were 1,860 qrs., 33 qrs. from Scotland, 1,858 qrs. by the Eastern Counties railway, and 58 qrs. by the Great Northern; making a total of 3,809 qrs. The supplies are now increasing. At Mark-lane the fourth Monday there were 4,569 qrs. coast-

wise, 2,987 qrs. by the Eastern Counties railway, 164 qrs. by the Great Northern, and 26 qrs. from Scotland; making a total of 7,740 qrs. Full prices were paid for choice qualities, with a good sale for such; but secondary sorts were rather cheaper, whilst grinding samples were quite as dear. The general averages since our last month's publication have been 36s. 4d. on 13,959 qrs., 37s. on 21,588 qrs., 38s. 4d. on 43,359 qrs., and 38s. 10d. on 58,768 qrs.

There has been a good business transacted in oats, particularly in the early part of the month. The first Monday, at Mark-lane, an advance of 6d. per qr. was obtained, with a steady sale for all descriptions. The supplies consisted of 170 qrs. coastwise, 306 qrs. by the Eastern Counties railway, 556 qrs. from Scotland, none from Ireland, but 20,421 qrs. from foreign ports; making a total of 24,373 qrs. At the second Monday in Mark-lane there was a ready sale for prime old foreign corn at 6d. to 1s. per qr. more money; but having an increased quantity from Ireland, samples of new were easier to purchase. The arrivals consisted of 36 qrs. coastwise, 986 qrs. by the Eastern Counties railway, 1,043 qrs. by the Great Northern, none from Scotland, but 7,230 qrs. from Ireland, and 4,141 qrs. from foreign ports; making a total of 13,436 qrs. A moderate business was transacted at the third Monday in Mark-lane, without any quotable change in the value of any description, except black Irish qualities, which were rather easier to purchase. The quantity arrived consisted of 198 qrs. coastwise, 676 qrs. by the Eastern Counties railway, 1,011 qrs. by the Great Northern, 20 qrs. from Scotland, 6,174 qrs. from Ireland, and 20,213 qrs. from foreign ports; making a total of 28,292 qrs. At the fourth Monday's market old corn supported prices with a steady sale; samples of black Irish were 6d., and in some instances 1s. per qr. lower. There were no English coastwise, 801 qrs. by the Great Northern railway, 829 qrs. by the Eastern Counties, 366 qrs. from Scotland, 10,100 qrs. from Ireland, and 6,844 qrs. from foreign ports; making a total of 18,940 qrs. There were 8,068 qrs. exported to the Crimea this week. The general weekly averages were 28s. 4d. on 16,427 qrs., 28s. 7d. on 16,493 qrs., 28s. 6d. on 15,207 qrs., and 27s. 9d. on 20,619 qrs.

The deliveries of beans have increased as samples of new have made their appearance in the various markets within the past few weeks. A good trade has been experienced for this article at all the consuming markets; prices have advanced 1s. to 2s. per qr. for every description, and at the outports rather more for Egyptians, this sort being sought after more than any other, being comparatively cheaper; and prices still tend up, as purchases cannot be made at Alexandria, with the advanced rate of freight, to stand as low as the holders have accepted, even with the recent enhancement in value. In London they are worth 42s. per imp. qr., weighing 56lbs. per bush.; and at Liverpool about 44s. per qr., 60lbs. per bush. The arrivals at Mark-lane the first Monday of the month were 490 qrs. coastwise, 167 qrs. by the Eastern Counties railway, and 37 qrs. by the Great Northern, with 1,129 qrs. from foreign ports; the second week 122 qrs. coastwise, 169 qrs. by the Eastern Counties, 20 qrs. by the Great Northern, and 1,878 qrs. from foreign ports; the third week 104 qrs. coastwise, 301 qrs. by rail, and 420 qrs. from foreign ports; and the fourth week 425 qrs. coastwise, 613 qrs. by the Eastern Counties railway, and 1,913 qrs. from foreign ports. The general averages were 49s. 5d. on 3,156 qrs., 48s. 10d. on 3,236 qrs., 49s. 11d. on 3,746 qrs., and 49s. 10d. on 4,888 qrs.

The article of peas was well nigh exhausted before the deliveries of new commenced, and now there is an increased quantity brought forward in all the agricultural districts, and good samples command high prices; indeed, white boilers had run up so fast that the upward tendency for this description was checked for one or two weeks (during which period they were bought 1s. to 2s. per qr. lower), but have since been in better request again, and a little cold weather will bring them into the same position they were in the early part of the month. Samples of hog qualities have not come out so freely, and these have steadily advanced throughout the month, and are now very high. Imperial blues are also extravagant in price, and in good demand. The arrivals the first week of the month were 287 qrs. coastwise, 127 qrs. by Eastern Counties railway, and 150 qrs. from foreign ports; the second week 164 qrs. coastwise, 242 qrs. by the Eastern Counties railway, 87 qrs. by the Great Northern, and 340 qrs. from foreign ports; the third week 1,096 qrs. coastwise, 380 qrs. by rail, and 1,498 qrs. from foreign ports; and the fourth week 880 qrs. coastwise, 226 qrs. by the Eastern Counties railway, and 226 qrs. from foreign ports. The general weekly averages were 45s. 4d. on 829 qrs., 46s. 2d. on 1,059 qrs., 48s. 7d. on 1,925 qrs., and 48s. 7d. on 1,915 qrs.

The imports of foreign grain for the month ended the 30th September, as published in the *London Gazette* of the 16th October, were 378,014 qrs. grain and 63,716 cwts. flour, against 292,151 qrs. grain and 90,187 cwts. flour the corresponding month of last year, and the different sorts stands thus, viz.:—

	1854.	1855.
Wheat....	91,547 qrs.	135,107 qrs.
Barley....	38,386 ,,	30,088 ,,
Oats	61,053 ,,	95,864 ,,
Rye.....	2,432 ,,	21 ,,
Beans....	51,359 ,,	15,400 ,,
Peas.....	5,150 ,,	7,793 ,,
Maize	42,224 ,,	92,686 ,,
Buckwheat	— ,,	19 ,,
Bigg	— ,,	136 ,,
Total..	292,151 ,,	378,014 ,,
Flour	90,187 cwt.	63,716 cwt.

These imports are less than the previous month to the extent of 205,178 qrs. grain and 69,330 cwts. flour; this falling off will continue, or probably be greater the next month, and remain so until we can receive larger quantities from the United States, which will not be materially increased until the shipments of November can arrive, probably about the month of January.

The exhausted stocks of wheat in nearly all the northern ports of Europe render it of no interest now, so little is passing in the article, and the shipments are at an end. At Danzig the supplies of new wheat do not come forward as usual at this season of the year, so much being used inland and where they generally come from; the small parcels which find their way down are worse in quality than expected, and the remnants of old on hand are kept for the purpose of improving the new by a good admixture: choice old has brought 94s. per qr. The stocks of old wheat in granary at Rostock are extremely limited; new comes forward in mere driblets, and cannot be calculated to weigh over 60 lbs. to 61 lbs. per bushel; such will cost 82s. per qr. free on board. There is very little wheat held at Hamburgh, and prices at that port are extremely high. 59 lbs. red Upland is worth 82s. 6d., 60 to 60½ lbs. new Mecklenburgh 83s. to 84s., 59½ lbs. fine old Rostock 84s. 6d., 57 to 57½ lbs. old Lower Elbe wheat 76s. 6d. per 480 lbs. free on board. 59½ to 60 lbs. new and old on the east coast of Holstein is worth 79s. 6d. per imperial qr., 60½ lbs. Stockholm is held at 79s., 59½ to 61 lbs. old and new Danish for autumn shipment is held at 79s. to 81s. per qr., and 59 to 59½ lbs. Pomeranian 79s. 6d. per imperial qr. Spring shipments meet some attention, and a few cargoes of 59½ to 60 lbs. Danish and Schleswick wheat have found buyers at 79s. to 80s. 6d. per imp. qr.

In the article of barley higher prices are paid at Hamburgh than in England. 45s. 6d. to 46s. per qr. of 448 lbs. have been obtained for 52 to 53 lbs. new Danish and Holstein: of Saale there is none offering. Oats on the spot have commanded 32s. to 33s. per qr. for Mecklenburg quality, and Holstein 31s. to 32s. per qr., weighed 42 lbs. on board. Beans have realized 47s. to 47s. 6d. per qr.; weight, 63 lbs. From the river Jahde new middle-sized beans can be bought at 44s. 6d. to 45s. per imp. qr. The finest boiling peas have brought 57s. per qr., weighed 504 lbs.

In Holland prices of wheat are very high: new Zealand at Rotterdam commanded 84s. to 86s. per qr. This year the weight is very moderate—127 to 128 lbs. the Dutch scale, 59 to 60 lbs. per imp. bushel. Fine old is very scarce, and this commands 88s. to 90s. per qr. 130 to 131 lbs. new red Upland, equal to 61 to 61½ lbs. per bushel, has brought 92s. to 94s. per qr.; 126 to 127 lbs. Rhine 86s. to 87s. per qr.

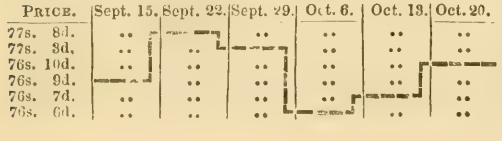
Wheat has been in brisk demand in the Belgian markets. At Antwerp fine qualities of red have brought about 91s. per qr., but white only 85s. to 86s. per qr. Rye has been in considerable request, and found buyers there at from 56s. to 57s. per qr. for their own growth; 52s. to 54s. per qr. for Danish; really choice heavy parcels realized 58s. 6d. to 60s. per qr.

There has been considerable amelioration in the French markets this month for the article of flour. During September prices had been run up to 118 francs per sack of 159 kilos., equal to about 78s. 6d. per sack of 280 lbs. for immediate delivery, and to 102 f. or about 68s. per sack for distant delivery —the stock on the 21st September having been reduced to about 4,666 quintals. On the 23rd of October, at Paris, the price stood at 104 f. to 105 f. for immediately delivery, at 102 f. to 103 f. for delivery at the close of the month, and for delivery four or six months from the month of November there were buyers at 101 f., but no sellers. The disposable stock at the above date was augmented to about 16,917 quintals, with daily receipts exceeding the sales of each day, and at the outports arrivals had commenced from America; but with all this, there is yet much anxiety shown by the French Government to obtain supplies from all quarters to make up their present estimated deficiency of 10,000,000 hectolitres of wheat grown this year short of their wants: every encouragement is held out to merchants to import, but the most serious check will be the monetary crisis now apparently more severe there than in England, and a great loss is resulting from the purchases of gold in this country to meet their present exigencies.

All eyes are still turned to America, in expectation of that country doing such wonders to supply France, England, and the northern ports of Europe, and the fabulous quantities some of their most sanguine writers talked of having to spare are steadily dwindling down to something more reason-

able. One party now says that those whose expectations have been so great "are likely to be disappointed in the quantity that will be shipped from New York this autumn;" and one of our tried and respected friends there estimates the quantity of wheat and flour which they will be enabled to spare and to export will not be equal to 3,000,000 qrs., and we put much faith in his opinion and calculation. Another statement makes the growth of England this year only twelve million quarters, and the average consumption at about 20,000,000 qrs., showing a deficiency of about 8,000,000 qrs. which the British Isles will require, and says if these estimates are correct that we are in an unpleasant "fix; and the question arises, where are they to get half the quantity they require to meet their wants—their usual sources of supply being cut off." "If half this deficiency exists," our friend across the Atlantic says, "we may look for a brisk demand for their flour, the coming year, and high prices." Many shipments of a very inferior quality of wheat have been made for England from States where it was sprouted, and the numerous sales effected cannot be completed for want of the article, and the differences are settled in money without the grain, and stocks as yet have not been large, nor sufficient to load the vessels which had previously been chartered for breadstuffs. By the last advices from New York, a considerable quantity of wheat and flour had been purchased for French and English account; and these purchases were reported to be for the Commissariat of the East, and thus the supplies will be diverted from both countries; and when this fact has been well authenticated, it will have some effect on the markets of Europe. Superfine States flour commanded 8⅝ d., equal to 37s. 8d. per brl.; and Ohio, 8¾ d. to 9 d., equal to 39s. 4d. per brl. The prices paid for red Western wheat were 190 c. to 195 c. per bush., equal to 65s. 9d. to 67s. 6d. per qr. of 60 lbs. per bush.; and for white 220 c. to 237 c., equal to 76s. 3d. to 82s. 3d. Red Southern wheat 195 c. to 205 c., equal to 67s. 6d. to 71s.; white 220 c., equal to 76s. 3d. per qr. of 60 lbs. per bush.; and for rye 125 c., equal to 43s. 4d. per qr. There have been some sales of Canadian wheat at 203 c. to 220 c. per bush. Indian corn was 3 c. to 4 c. per bushel dearer; mixed, 90 c. to 91 c. per 56 lbs. free on board. Freights to Liverpool, 4s. per brl. for flour, and 10d. to 11d. per bushel on grain.

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING OCTOBER 20, 1855.



CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter					
Wheat, Essex and Kent, white, old..	75	to	80	extra	80	85
Ditto new .	64		80	„	—	—
Ditto, red, old .	74		77	„	79	84
Ditto, new .	60		76	„	—	—
Norfolk, Linc. and Yorksh., red, old	76		78	„	80	82
Ditto, new	58		72	„	—	—
Barley, malting, new..	37	38	....	Chevalier..	41	43
Distilling....	37	41	.....	Grinding ..	35	38
Malt, Essex, Norfolk, and Suffolk....	72		74	extra	80	
Kingston, Ware, and town made..	73		76	„	80	
Brown	62		67	„	—	
Rye	—		—		43	47
Oats, English feed..	26	27	.....	Potato..	27	34
Scotch feed, new	29	30, old	33	34 .. Potato	33	34
Irish feed, white	24		25	fine	27	
Ditto, black	22		24	„	27	
Beans, Mazagan.....	39		41	„	41	42
Ticks.....	40		44	„	43	44
Harrow.....	40		43	„	43	45
Pigeon	43		48	„	48	50
Peas, white boilers	50	55..	Maple	42	46	Grey 42 45
Flour, town made, per sack of 280 lbs.	—		—		73	75
Households, Town 64s. 65s.	Country		—		61	62
Norfolk and Suffolk, ex-ship	—		—		58	59

FOREIGN GRAIN.

	Shillings per Quarter.					
Wheat, Dantzic, mixed..	89	to	91	high mixed	—	92 extra 97
Konigsberg	84	86		„	—	90 „ 92
Rostock, new	82	86		fine	90	„ 94
American, white	88	90		red	80	83
Pomera., Meckbg., and Uckermk., red					84	85 extra 85 89
Silesian.....				„	81	83 white 85 87
Danish and Holstein				„	74	80 „ 80 84
Rhine and Belgium.....				„	—	— old — —
Odessa, St. Petersburg and Riga..	75	77	fine	79	82	
Barley, grinding	34	37	.....	Distilling..	25	38
Oats, Dutch, brew, and Polands 30s. to 33s.				Feed ..	27	29
Danish & Swedish feed 28s. to 30s.				Stralsund	29	31
Russian.....				French..	none	
Beans, Friesland and Holstein.....					43	44
Konigsberg ..	40	45	.....	Egyptian ..	39	41
Peas, feeding	42			44 fine boilers	52	54
Indian Corn, white	40		41	yellow	41	45
Flour, French, per sack.....	—		—	Spanish	65	66
American, sour, per barrel	42		45	sweet	42	47

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Sept. 15, 1855..	76	9	35	3	28	6	45	3	48	0	43	5
Sept. 22, 1855..	77	8	35	9	28	8	47	8	49	1	42	11
Sept. 29, 1855..	77	3	36	4	28	4	48	8	49	5	45	4
Oct. 6, 1855..	76	6	37	0	28	7	50	10	48	10	46	2
Oct. 13, 1855..	76	7	38	4	28	6	49	8	49	11	48	7
Oct. 20, 1855..	76	10	38	10	27	9	50	5	49	10	48	7
Aggregate average of last six weeks	76	11	36	11	28	5	48	9	49	2	45	10
Comparative avge. same time last year	55	5	29	10	25	5	35	3	44	1	38	6
Duties	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1854.	Qrs.	Av. s.	d.
Wheat....	144,869 ..	76	10	Wheat....	150,277 ..	57	6
Barley....	58,768 ..	38	10	Barley....	47,211 ..	31	3
Oats	20,619 ..	27	9	Oats	16,452 ..	25	9
Rye.....	1,042 ..	50	5	Rye.....	980 ..	35	2
Beans....	4,887 ..	49	10	Beans....	4,974 ..	44	10
Peas	1,915 ..	48	7	Peas	1,776 ..	40	9

PRICES OF SEEDS.

BRITISH SEEDS.

Tares, winter (per bushel)	8s. to 9s.
Coriander (per cwt.)	20s. to 24s.
Carraway (per cwt.).... new 40s. to 44s., old	40s. to 44s.
Canary (per qr.)	56s. to 63s.
Hempseed (none)	00s. to 00s.
Linseed (p. qr.) sowing .. s. to .. s., crushing	72s. to 79s.
Linseed Cakes (per ton)	£13 10s. to £14 0s.
Rapeseed (per qr.)	new 90s. to 94s.
Ditto Cake (per ton)	£6 10s. to £7 0s.

FOREIGN SEEDS, &c.

Hempseed, small, (per qr.) 48s. 50s., Ditto Dutch,	54s.
Coriander (per cwt.)	15s. to 20s.
Carraway	36s. to 38s.
Linseed (pr qr.) Baltic, 71s. to 74s.; Bombay,	75s. to 78s.
Linseed Cake (per ton)	£12 0s. to £13 10s.
Rapeseed, Dutch	90s. to 94s.
Rape Cake (per ton)	£6 10s. to £7 0s.

HOP MARKET.

BOROUGH, MONDAY, Oct. 29.

We cannot report any change in our market during the past week. The demand continues rather inactive, and prices have a downward tendency.

Sussex Pockets	70*s.*,	80*s.* ,,	94*s.*
Weald of Kents	70*s.*,	84*s.* ,,	95*s.*
Mid and East Kents	80*s.*,	100*s. to*	120*s.*

WORCESTER, (Saturday last.)—The market was heavy at 4s. or 5s. decline upon low and inferior samples; choice colours better maintained last week's rates.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

MONDAY, Oct. 29.

During the past week there has been only a few arrivals coastwise from Scotland, Kent, and Essex, and although the supply has been limited at this market, still at others there has been a considerable quantity by rail and land-carriage; trade has been dull, particularly for Scotch, many of which are in bad condition.

The following are this day's quotations:

	s.	d.	s.	d.
Kent and Essex Regents	80	0 to	90	0
East Lothian do.	80	0 —	90	0
Perth, Forfar, and Fifeshire do.	50	0 —	75	0

BOROUGH AND SPITALFIELDS.

MONDAY, Oct. 29.

Since Monday last the arrivals of potatoes up to these markets have been moderate, and in excellent condition. For most kinds we have a steady trade, as follows:—York Regents, 85s. to 100s.; Middlings, 60s. to 70s.; Blues, 70s. to 85s.; Lincolns, 75s. to 85s.; Shaws, 65s. to 80s.; Bradford Regents, 90s. to 95s.; Irish, 75s. to 85s. per ton.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.
Friesland	108 *to*	112
Kiel	100	110
Dorset, new	110	116
Carlow	104	106
Waterford	98	102
Cork, new	94	106
Limerick	98	102
Sligo	94	102
Fresh, per doz.	12s. 0d.	14s. 0d.

Cheese, per cwt.	s.	s.
Cheshire ....*new*	70 *to*	84
Cheddar	,, 74	90
Double Gloucc.	,, 66	76
Single do.	,, 60	70
Hams, York	94	106
Westmoreland.	,, 90	100
Irish	,, 90	98
Bacon, Wilts., dried	78	82
Irish, green	74	76

ENGLISH BUTTER MARKET.

LONDON, October 29.

During the week we have had a good trade in Butter, at more money for fine qualities; but this morning a dulness is perceptible.

Dorset fine	114*s. to*	116*s. per cwt.*
Do. middling	104*s. to*	106*s.* ,,
Devon	106*s. to*	108*s.* ,,
Fresh	12*s. to*	14*s. per doz. lbs.*

BELFAST, (Friday last.)—Butter: Shipping price, 98s. to 106s. per cwt.; firkins and crocks, 10d. to 11d. per lb., Bacon, 60s. to 66s.; Hams, prime, 84s. to 90s., second quality, 66s. to 70s. per cwt.; prime mess Pork, 92s. 6d. to 95s. per brl.; beef, 105s. to 140s. per tierce; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 62s. to 64s. per cwt.

Oct.	*Butter. per cwt.* s. d.	s. d.	*Bacon. per cwt.* s. d.	s. d.	*Dried Hams, per cwt.* s. d.	s. d.	*Mess Pork. per brl.* s. d.	s. d.
20.								
1851..	72 0	82 0	45 0	47 0	60 0	62 0	58 0	62 0
1852..	72 0	78 0	50 0	56 0	66 0	70 0	85 0	90 0
1853..	95 0	100 0	58 0	60 0	74 0	78 0	85 0	87 6
1854..	90 0	95 0	54 0	60 0	68 0	74 0	90 0	95 0
1855..	98 0	106 0	60 0	66 0	84 0	90 0	92 6	95 0

COVENT GARDEN MARKET.

SATURDAY, OCT. 27.

Most kinds of fruits in season continue plentiful, especially English Grapes, which still meet with a dull trade. Pears now consist of Marie Louise, Gansel's Bergamot, Louise Bonne, Brown Beurré, and Duchesse d'Angoulême. But to these must be added good samples of Gratioli and Chaumontelles, which have been received this week from Guernsey and Jersey. Walnuts are plentiful, and produce from 10s. to 20s. per bushel. Of Filberts and Cobs there is a better supply, but the sale for them is far from brisk. Damsons are becoming scarcer, and prices for them better. Oranges fetch from 1s. to 1s. 6d. per dozen. Of Potatoes there is an increased supply, and trade for them is not so good as last week. Lettuces realize from 6d. to 9d. per score. Cut flowers consist of Passion-flowers, Heliotropes, Euphorbias, Verbenas, Japan Lilies, Cyclamens, Chinese Primroses, Heaths, and Roses.

FRUIT.

	s.	d.	s.	d.		s.	d.	s.	d.
Pineapples, p. lb.	4	0	@6	0	*Apples, p. hf. sve.*	1	0	1	6
Grapes, per lb.	1	6	6	0	*Pears, per doz*	0	9	1	6
Peaches, per doz.	4	0	8	0	*Do., per hf. sv.*	2	0	5	0
Plums, per sieve.	5	0	7	0	*Filberts p. doz. lbs*	6	0	9	0
Figs, per doz.	0	9	1	6	*Cobs, do.*	9	0	0	0
Melons, each	1	0	2	6					

VEGETABLES.

	s.	d.	s.	d.		s.	d.	s.	d.
Cauliflowers p dz.	2	0	5	0	*Onions, p. 12 bun.*	2	6	4	0
Broccoli, per doz.	0	6	1	0	*Leeks, per bunch*	0	1	0	2
Fr. Beans, p. ½ s.	2	0	3	0	*Capsicums, p. 100*	1	0	2	0
Potatoes, per ton	50	0	90	0	*Veg Marrows pdz*	0	4	1	0
Do., per cwt.	3	6	5	0	*Shallots, per lb.*	0	4	0	6
Do., per bush.	2	0	4	0	*Garlic, per lb.*	0	6	0	8
Carrots, p. bun.	0	3	0	5	*Lettuce, Cab., p. s.*	0	9	1	0
Turnips, p. bun.	0	2	0	4	*Do., Cos., p. sc.*	1	0	1	6
Cucumbers, each	0	3	0	6	*SmallSal. p. pun.*	0	2	0	3
Tomatoes, p. ½ se.	3	0	4	0	*Horserad., p. bnd.*	2	0	4	0
Spinach, p. sieve.	1	0	1	6	*Mushr'ms, p. pot.*	1	3	1	9
Beet, per doz.	1	0	2	0	*Parsley, p. bunch*	0	2	0	3
Celery, per bund.	0	9	1	3	*Marjoram. per bh.*	0	2	0	3
Artichokes, p. dz.	3	0	4	0	*Mint, gr., p. bun.*	0	2	0	3

HAY MARKETS.

SATURDAY, OCT. 27.

SMITHFIELD.—A fair average supply, and a steady demand.

CUMBERLAND.—Supply tolerably good, and trade rather firm.

WHITECHAPEL.—Both hay and straw were in fair request, at full prices.

At per load of 36 trusses.

	Smithfield.	*Cumberland.*	*Whitechapel.*
Meadow Hay	75*s.* 126*s.*	78*s.* 130*s.*	75*s.* 126*s.*
Clover	80*s.* 135*s.*	80*s.* 132*s.*	80*s.* 138*s.*
Straw	28*s.* 33*s.*	28*s.* 34*s.*	28*s.* 33*s.*

CHICORY.

LONDON, SATURDAY, OCT. 27.

There is only a limited business doing in all kinds of Chicory, and the quotations are almost nominal. The imports are only 2 bales from Harlingen. The supply in the market is but moderate.

Per ton.

	£	s.	£	s.
Foreign Root (in bond) Harlingen	11	0	11	10
English Root (free)				
Guernsey	9	0	9	10
York	9	10	10	0
Roasted & ground				
English	14	0	20	10
Foreign	30	0	36	10
Guernsey	26	0	28	0

HIDE AND SKIN MARKETS.

SATURDAY, OCT. 27.

	s.	d.	s.	d.	
Market Hides, 56 to 64 lbs	0	3½	0	3¾	*per lb.*
Do. 64 72 lbs	0	3¾	0	0	,,
Do. 72 80 lbs	0	3¾	0	4	,,
Do. 80 88 lbs	0	4	0	4¼	,,
Do. 88 96 lbs	0	4¼	0	4½	,,
Do. 96 104 lbs	0	4¾	0	5	,,
Horse Hides each	6	6	0	0	*each.*
Calf Skins, light	2	0	3	0	,,
Do. full	6	6	0	0	,,
Kents	3	8	4	8	,,
Half-breds	3	8	4	8	,,
Polled sheep	3	10	5	2	,,
Downs	3	0	3	6	,,
Lambs	2	9	4	6	,,

LEADENHALL LEATHER MARKET.

Our market continues very firm, and prices of all goods are freely supported.

CROP HIDES.

ENGLISH.

lbs.	lbs.	d.	d.
28 to	35	13 to	14
36	40	13½	14½
40	45	14	15½
46	50	14½	16
50	55	15	17
55	60	16	18

BUTTS.

ENGLISH.

lbs.	lbs.	d.	d.
14	16	16½	18
17	20	17	18½
21	24	17½	19½
25	28	19	22
29	32	20	23
33	36	21	24

FOREIGN.

lbs.	lbs.	d.	d.
14	16	16	17
17	20	16½	17½
21	24	16½	19
25	28	18	20
29	32	18	21
33	36	19	21
36	45		
45	55		

OFFAL.

	d.	d.
ENGLISH Shoulders	12 to	14
Do. Cheeks and Faces	6	9
Do. Bellies	9	11
Do. Middles do.	11	12
FOREIGN Shoulders	11	12
Do. Necks	9	10
Do. Bellies	8	10
Do. Middles do	10½	12
Dressing Hide Shoulders	10	12
Do. do. Bellies	7½	9
Kip Shoulders	5	8
Do. Bellies	4	5

DRESSING HIDES.

	lbs.	lbs.	d.	d.
Common	20 to	24	14 to	15½
Do.	25	28	14	15½
Do.	30	34	14	15½
Do.	35	40	14	15½
Saddlers	30	35	15	16
Do.	36	50	15	16½
Bulls			11	12
Shaved	14	16	17	18½
Do.	17	19	16½	18½
Do.	20	23	16	18
Do.	24	28	15	17
Scotch do.	16	24	16	18½
Coach, per Hide			26s. to	30s.

HORSE BUTTS. Shaved.

	d.	d.	d.	d
English	9 to	11	12 to	14
Spanish	9	11	12	13½

HORSE HIDES.

	lbs.	lbs.	d.	d
English	13 to	18	8 to	10
Do. without butts	9	14	8	10

Spanish salted, without butts,			s. d.	s. d.
per hide	6	8	6 6	9 6
Do. do. do.	9	11	9 6	11 0
Do. do. do. inferior			4 6	7 0
Do. dry do.	6	8	5 6	8 6
Do. do. do.	9	11	8 0	10 0
Do. do. do. inferior			4 0	6 0

CALF SKINS

Av. weight. lbs.	lbs.	Unrounded, d.	d.	Rounded. d.	d.
20 to	28	13 to	15	15 to	21
30	35	13½	16	15	21
35	40	13½	17	15½	23
40	45	14	18	16	24
45	50	14½	18	17	24
50	55	15	19	17	24
55	60	15	20	17	24
60	70	15	19	17	23
70	80	15	18	16	23
80	90	14	17	16	22
90	100	14	16	15	21
100	120	13	15	14	10

KIPS. 9

	lbs.	lbs.	d.	d.
Petersburgh	4 to	7	15 to	18
Do.	7	9	15	18
Do.	9	10	14	17
Do.	11	13	13	16
E. India, dry sltd	5	7	15	19
Do. do.	7	9	14	18
Do. seconds			14	16
Do. thirds			11	12
Do. inferior			8	10

SUNDRIES.

		s.	s.
Hog Skins, best	each	10 to	18
Do. seconds	,,	8	10
Seal Skins, split	per doz.	42	54
Do. for bindings	,,	42	60
Calf Skins, Sumach-tanned	,,	30	40
Do: white	,,	20	33
Horse Hides, white	each	6	12
Sheep Skins—			
Basils, unstrained	per lb	9	14
Do. strained	,,	10	15
Do. facing	per doz.	6	18
Tan Sheep & Lambs	,,	10	22
White Sheep	per 120	80	110
Do. Lambs	,,	60	90
Do. Sheep & Lambs, strained	per doz.	7	18
Sumach Roans	,,	20	38
Do. Skivers	,,	10	16
Bark Skivers	,,	12	16
Hide Splits	per lb	7½d. to	8d.

FLAX, HEMP, COIR, &c.

We have to report a very quiet market for Flax. Prices, however, are mostly supported. Russian Hemp is dull, at £43 per ton for Petersburgh clean. Manilla qualities are rather dearer. Jute and Coir goods rule about stationary.

OIL MARKET.

	£	s.	d.		£	s.	d.
Olive, Florence half-chests	1	2	0	*to*	0	0	0
Lucca	7	10	0		8	0	0
Gallipoli (252 gallons)	55	0	0		56	0	0
Spanish	53	10	0		55	0	0
Linseed (cwt.)	2	2	0		2	2	3
Rape, Pale	3	0	0		3	0	6
Brown	2	5	0		2	7	0
Cod (tun)	47	0	0		48	0	0
Seal, Pale	54	0	0		55	0	0
Ditto, Brown, Yellow, &c.	50	0	0		53	0	0
Sperm	120	0	0		121	0	0
Head Matter	102	0	0		104	0	0
Southern	51	0	0		54	0	0
Cocoa Nut (cwt.)	2	5	0		2	7	0
Palm	2	5	0		2	7	0
WHALEBONE.							
Greenland, full size (per ton)	260	0	0		262	0	0
South Sea	185	0	0		190	0	0
PITCH.							
British (per cwt.)	0	6	9		0	7	0
Archangel	0	10	6		0	0	0
Stockholm	0	12	0		0	0	0
TURPENTINE.							
Spirits (per cwt.)	1	16	0		1	17	0
In Puncheons	1	15	0		0	0	0
Rough	0	10	0		0	10	3
TAR.							
American (British)	1	2	0		1	4	0
Archangel	2	0	0		0	0	0
Stockholm	1	4	0		0	0	0
RESIN.							
Yellow (per cwt.)	0	5	3		0	12	6
Transparent	0	5	3		0	5	6

MANURES.

LONDON, OCTOBER 29.

PRICES CURRENT OF GUANO.

		£	s.	d.		£	s.	d.
Peruvian Guano	*per ton*	£11	5	0	*to*	£11	10	0
,, *D. first class (damaged)*	,,	10	5	0		10	10	0
Bolivian Guano (none)	,,	0	0	0		0	0	0
ARTIFICIAL MANURES, OIL CAKES, &c.								
Nitrate Soda	,,	19	0	0		20	0	0
Nitrate Potash or Saltpetre	,,	28	0	0		30	0	0
Sulphate Ammonia	,,	16	0	0		17	0	0
Muriate ditto	,,	22	0	0		23	0	0
Superphosphate of Lime	,,	5	0	0		6	0	0
Soda Ash or Alkali	,,	0	0	0		6	0	0
Gypsum	,,	2	0	0		2	10	0
Coprolite	,,	4	5	0		4	10	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping	,,	42	0	0		43	0	0
Salt	,,	1	5	0		2	0	0
Bones, Dust	*per qr.*	1	3	0		1	4	0
,, *½ inch*	,,	1	1	0		1	2	0
Oil Vitriol, concentrated	*per lb.*	0	0	1		0	0	0
,, *Brown*	,,	0	0	0¾		0	0	0
Rape Cakes	*per ton*	8	0	0		8	5	0
Linseed Cakes—								
Thin American in brls. or bags	,,	13	10	0		14	0	0
Thick ditto round	,,	12	0	0		12	5	0
Marseilles	,,	12	0	0		12	10	0
English	,,	13	0	0		13	10	0

PICKFORD and KEEN, 35, Leadenhall-street.

Nitro-Phosphate and Ammonia-Phosphate, manufactured by Hodgson and Simpson, Calder Soap Works, Wakefield, and Matthews and Co., Driffield, per ton £8 0 0

Price Current, Stowmarket, Suffolk.

Prentices' Turnip Manure ....*per ton* £7 0 0
Prentices' Superphosphate .... ,, £6 10 0

Lancashire Manure Company.

Widnes, near Warrington, J. Knight and Co.'s Nitrogenized Bone Manures ....*per ton* £8 15 0

Williams and Co., 24, Mark Lane, Azotic £6 10 0

Printed by Rogerson and Tuxford, 246, Strand, London.

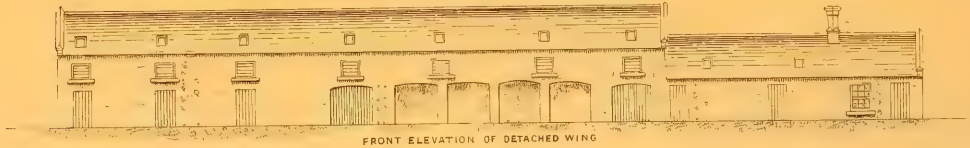
Scotland and Ireland, by an actual enumeration insti- | Clanboye, with Skirving's purple-top swedes, in

Nº 2

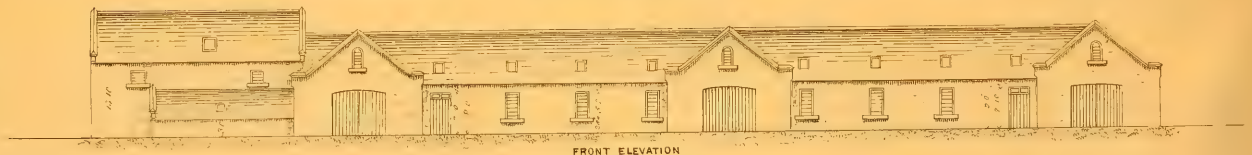
DESIGN FOR A COVERED HOMESTEAD AT SILLYFLATT, KINCARDINESHIRE, N. B.

DESIGNED BY DAVID DICKSON ESTATE AGENT LAURENCEKIRK, N. B.

END ELEVATION.



FRONT ELEVATION OF DETACHED WING



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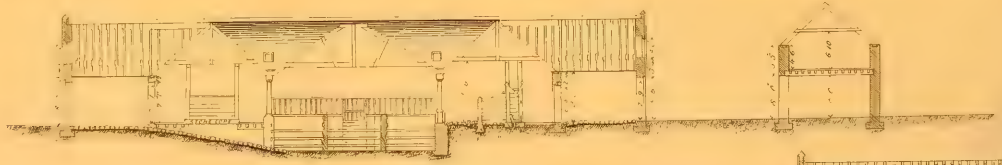

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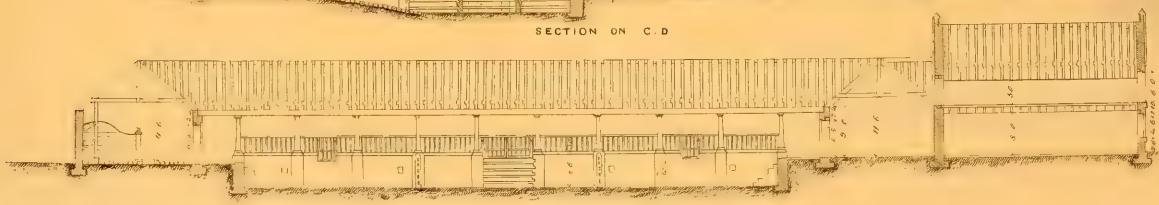

SECTION ON A B

ROGERSON & TUXFORD, LITHO. 246 STRAND

THE FARMER'S MAGAZINE.

DECEMBER, 1855.

PLATE I.

A DEVON HEIFER,

THE PROPERTY OF HIS ROYAL HIGHNESS PRINCE ALBERT.

The subject of our first plate is a Devon Heifer, bred by the late Mr. Samuel Farthing, of Stowey Court, Bridgwater; and the property of His Royal Highness Prince Albert, for which the first prize of Ten Sovereigns was awarded at the Birmingham Cattle Show, and the second prize of Five Sovereigns at the Smithfield Club Cattle Show, December, 1854.

PLATE II.

NO. II.—DESIGN FOR A COVERED HOMESTEAD, AT SILLYFLATT, KINCARDINESHIRE, NORTH BRITON.

DESIGNED BY DAVID DICKSON, ESTATE AGENT, LAURENCEKIRK, NORTH BRITON.

(For description see the October part, page 277.)

THE STORING AND FEEDING PROPERTIES OF TURNIPS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The storing and winter consumption of turnips will, during the present month, be a subject of the utmost interest to the readers of this magazine; any suggestions, therefore, for their improved storage, or careful trials upon their varying feeding qualities, when employed as either stored or as drawn from the field, or when grown by different manures, will be valuable and opportune. The investigation is evidently one of great importance, and any general improvement in their nutritive qualities or their winter preservation becomes even nationally interesting when we consider the acreage devoted to their growth. The extent of this was ascertained with regard to the turnip crops of 1854 in Scotland and Ireland, by an actual enumeration instituted by the Secretary of State, and for the turnip crop of England partly by estimation and partly by actual observation. The returns for the United Kingdom gave in imperial acres devoted to turnips in

England	470,379	acres
Scotland	433,915	„
Ireland	329,106	„
United Kingdom	1,233,400	„

Several series of trials have been made, with rather discordant results, upon the comparative feeding properties of turnips raised on the same soil, but by different manures. The most recently reported are those of Mr. Andrew Templeton, of Clanboye, with Skirving's purple-top swedes, in

1853-4, in the feeding of twelve half-bred short-horns divided into four lots of three each (*Jour. Roy. Ag. Soc.*, vol. xvi., p. 164).

The turnips in this experiment were grown in plots of an imperial acre each; they were raised between the 16th of December and the 3rd and 4th of February, when the weights of sound well-fed bulbs were as follows:—

	Tons.	Cwts.	Qrs.
Lot No. 1, with 24 tons farm-yard manure, produced of bulbs	18	3	0
Lot No. 2, with 12 tons farm-yard manure and 2½ cwt. Peruvian guano, produced of bulbs	17	14	3
Lot No. 3, with 5 cwt. Peruvian guano, produced of bulbs	12	8	1
Lot No. 4, with 12 tons farm-yard manure and 12 bushels bones, produced of bulbs	16	0	0

"The above lots," remarks Mr. Templeton, "were kept entirely separate from any other turnips, and in charge of a man who did not feed the heifers, but whose duty it was to have the daily allowance of each separate lot cut, and put into their respective places, so as no mistake could occur with the feeding. I may here remark, that during the experiment the heifers all fed remarkably well, and were very healthy. They were fed three times a-day; at 5 o'clock in the morning they got one-third of their turnips; having finished them, they got each 4lbs. of hay; at 10 o'clock forenoon they got the same, and at 3 o'clock afternoon they got the remaining third of the turnips, and 6lbs. oat-straw each; after each feed the house was well cleaned, and their beds made up with dry straw; at the forenoon feed the cattle were well cleaned with comb and brush; the appointed times of feeding were strictly attended to, and nothing allowed to disturb them from rest, except at their regular feeding times. The cattle for this experiment were 12 heifers, half-bred short-horns, 2½ years old, which were purchased at Carlingston Bridge Fair, County Meath, on the 19th November, 1853, at £11 each; they were home here on the 21st, and were turned into a grass field, and had a few turnips given them daily; on the 2nd December they were put into a very good, well-constructed feeding house, with stalls for 12 head, and allowed Swedish turnips, hay, and straw; they having been all accustomed to turnips, they all commenced to feed well; thus, every precaution was taken to give them a fair trial when the experiment would commence. On the 12th December I had the 12 heifers divided into four lots, of three in each lot, had them numbered, and each animal weighed, the gross weight of each lot being nearly equal, as will be observed by the following table," in which column I. gives the description of food; II., the live weight of three heifers on the 12th December; III., their weight on the 24th April; IV., their increase of weight during 132 days, and V. the quantity of turnips consumed by each lot:—

I.	II.			III.			IV.			V.		
	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.
Lot 1.—Fed on turnips grown with farm-yard manure.....	27	1	7	35	2	0	8	0	21	237	0	0
Lot 2.—Fed on turnips grown with farm-yard manure and guano.....	26	2	14	32	3	0	6	0	14	219	1	0
Lot 3.—Fed on turnips grown with guano	26	2	14	33	1	14	6	3	0	226	1	7
Lot 4.—Fed on turnips grown with farm-yard manure and bones	27	2	21	34	3	0	7	0	7	222	3	0

We find, then, from the result of these trials, that the turnips grown with farm-yard manure gave an increase of 1lb. of live weight for every 29lbs. of turnips, for every 35¾lbs. grown with farm-yard manure and guano, for every 33½lbs. grown with guano, and for every 31½lbs. grown with bones. If we take the acres of turnips, we find that the acre manured with farm-yard manure would give an increase of live weight of 1,402 lbs.; that with farm manure and guano, 1,111 lbs.; that with Peruvian guano, 830 lbs.; that with farm manure and bones, 1,138 lbs.

Some experiments of Mr. W. Goodlet, of Erskine, seem to support the conclusion of Mr. Templeton as to the superior fattening properties of turnips grown with farm-yard manure (*Trans. High. Soc.*, 1852, p. 231). His plots of swedes were manured with, per imperial acre—

1, 20 tons of farm-yard manure.
2, 4 cwt. of Peruvian guano.
3, 10 tons of farm-yard manure, and 2 cwt. of guano.

In four months his lots of cattle fed with—
1, Dunged turnips, increased in weight 2,538 lbs.
2, With guano, 2,318 lbs.
3, Half dung and half guano, 2,435 lbs.

Another branch of the inquiry as to the varying nutritive powers of turnips, is that pursued by Mr. J. Porter, of Monymusk, in Aberdeenshire, detailed in his prize essay upon the storing of turnips (*Trans. High. Soc.*, 1855, p. 98). That turnips stored either in sheds, or in pits or clamps, are more nutritive than those left exposed to the weather in the field, and drawn as they are required, is pretty commonly understood. It was to examine the amount of the difference experimentally that Mr.

Porter made his valuable trials, which I give nearly in his own words. The turnips employed were of the best "golden yellow" variety, and in the end of November, 1854, the necessary quantity for the experiment was stored in the field in heaps or pits; they were of a deep orange colour, and in point of quality may be classed next to the Swedish turnip. On the 28th of January, 1855, eight cattle coming two years old were selected for the experiment; they were weighed on the steel-yard, and divided into two lots as nearly equal in weight and quality as the circumstances would permit. One lot was then tied up, and fed with the stored turnips; and the other, on the same kind of turnips pulled and drawn from the field, load by load, as the cattle consumed them, all clear of tops and tails. The stored turnips were also brought from the field as required in the same manner. The feeding-byre was roomy and well ventilated, and contained four double stalls, two for each lot, so that the animals were kept perfectly separate, and enjoyed the same freedom, comfort, and air, the byre being kept as nearly as possible at a temperature of 48 degrees Fahrenheit. Both lots of cattle received equal quantities of turnips daily, nearly as many as they could eat, with oat-straw *ad libitum*, for a period of 84 days, when it was found that they had consumed 28½ tons of turnips, or an average of 95 lbs. per day to each beast. From the 20th of October till they were tied up, both lots of cattle were fed in loose sheds, four and four together, on headed turnips and straw, the first six weeks on white globes, and the rest of the time on golden yellows. Up to the time the experiment commenced, the weather happened to be soft and fresh, and in that case, and at that season of the year, it is likely that little difference would have arisen in feeding on turnips from the stores or from the field. The experiment, however, just began with the bad weather, and continued through two months of very severe frost and snow, and a month of dry, windy spring weather, both of which were well suited for testing the effects of stored turnips. A reference to the following table (concludes Mr. Porter) will show the result of the experiment, and strongly indicate that the period of trial was quite long enough for the unfortunate animals that were fed from the fields from day to day.

THE WEIGHTS OF THE FOUR FED ON STORED TURNIPS.

	On Jan. 28.			On April 22.			Increase.		
	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.
1	8	0	0	8	3	14	0	3	14
2	8	2	0	9	0	14	0	2	14
3	8	0	14	8	3	21	0	3	7
4	9	2	0	10	0	14	0	2	14
Total increase of each lot							2	3	21

THE WEIGHTS OF THE FOUR FED WITH TURNIPS PULLED AS REQUIRED.

	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.	Cwt.	qrs.	lbs.
1	9	0	0	9	2	14	0	2	14
2	7	2	14	7	3	21	0	1	7
3	9	2	7	10	0	14	0	2	7
4	8	0	0	8	1	14	0	1	14
Total increase on each lot							1	3	14
Balance in favour of stored turnips							1	0	7

There is, no doubt, a considerable difference in the chemical composition of the stored and unstored turnips. Dr. Apjohn found that an orange globe turnip, suspended in the open air under a shed for fourteen days, was reduced in weight, between January 23 and February 6, from 3540 grains to 2027 (*Quar. Jour. of Agric.*, 1854, p. 219); and that there is also a considerable difference in the composition of the turnips grown with different manures, was some time since shown by Professor Anderson, from the result of a series of chemical examinations of the yellow turnips grown at Lord Kinnaird's farm of Millhill. These results will be found in the following tables. The different turnips were all manured with 16 tons of farm-yard manure, valued at £4, and had, in addition, quantities of different auxiliary manures. In the first table, column I. gives the number of the experiment and the manure; II., the cost; III., the produce of turnips; IV., the gain in tons and cwts. (*Trans. High. Soc.*, 1852, p. 216)—

I.	II. £ s.	III. £ s.	IV. £ s.
0. 16 yards dung	4 0	24 0	—
1. 4 cwt. White's manure	1 4	28 5	4 5
2. 2 cwt. guano, 2 cwt. salt	1 2	28 15	4 15
3. 3 cwt. guano	1 10	27 2	3 2
4. 3 cwt. Baillie's bone manure	1 4	25 18	1 18
5. 3 cwt. coprolite	1 4	25 0	1 0
6. 3 cwt. London Manure Company's manure	1 4	27 14	3 14
7. 4 cwt. superphosphate	1 4	26 7	2 7
8. 3 cwt. guano, 1 cwt. superphosphate, diluted with 200 gals. water	2 2	27 4	3 4
9. 3 cwt. superphosphate, diluted with 200 gallons water	1 16	27 15	3 15

In the following table, column I. gives the number (referring to the preceding table) of the experiments; II., the quantity of water found in 10,000 parts of the turnip; III., the ash; IV., the protein compounds; V., the fibre, sugar, &c.; VI., the nitrogen found in these differently manured turnips. No analysis was made of Nos. 4 and 5, as the gain was not equal to the cost of the manures.—

I.	II.	III.	IV.	V.	VI.
0	9327	39.6	83.8	549.6	13.2
1	9287	67.0	63.5	482.5	10.0
2	9411	55.0	68.5	465.5	10.8
3	9345	58.0	82.5	514.5	13.1
6	9285	76.0	95.8	543.2	15.5
7	9243	59.0	73.0	625.0	11.0
8	8862	75.0	117.4	945.0	18.5
9	9509	56.2	41.3	399.5	6.5

The chief rules with regard to turnip storing, are to store them as dry and clean as possible, and in the store to keep them dry and well ventilated. Mr. Porter is in favour of leaving the tops in the field, and ploughing them in as soon as possible. Sometimes (he says) this cannot be done at once; but whether or not, I have always seen beneficial effects on the succeeding crops of grain where the turnip-tops were left on the land in any shape. He prefers storing as many at the homesteads as will last six or eight weeks; he prefers this to be under a temporary rough shed or covering of wood (erected piecemeal, as the turnips are deposited), about 6 or 7 feet wide (so as to admit a cart), and 4 feet high. For spring use, however, he prefers storing in the soil; this he accomplishes by throwing aside the turnips of the two centre rows of twelve drills; he then ploughs out right and left in the cleared space two deep furrows, deposits in the trench thus formed the 12 rows of turnips, and then turns the earth back over them by the plough and a little aid from the spade, so as to amply protect them from frost and vermin. By this mode of storing, the turnips keep very well, and do not lose weight; but this latter result, I think, is an object rather too highly regarded by Mr. Porter.

It is always desirable to test the correctness and the amount of value to be assigned to any commonly received opinion; and if it were only in this point of view, the experiments I have been describing would be of very considerable value to the agriculturist; but they become of still greater importance when we reflect that these are only the commencement of other more important advances in the feeding of live stock—a branch of farming to which I am the more inclined to direct the English farmer's attention, since there is reason to believe that the production of animal food will long continue to be the most regularly profitable branch of his excellent but most difficult profession.

ON THE USE OF GORSE FOR FEEDING STOCK.

It is an ill wind, says the proverb, which blows nobody good; and, on the other hand, it must be a good wind which blows nobody ill. The farmer who exclaimed, "Now I have got up my hay, a little rain would be a great thing for the country—it would bring up the turnips," only gave utterance to a feeling in which, however unconsciously, we all indulge—that of supposing our own to be the general interest. On the whole, therefore, with all our respect for farmers, we are quite content that neither they nor their kindred gardeners have the management of the weather.

The state of things which prevailed when the above celebrated speech was uttered, appears to be very similar to that which prevails at present in Norfolk, where the turnip crop is suffering severely from that hot and dry weather, the continuance of which was so beneficial to the backward harvests of our northern districts. The turnips, which in general had planted well there, are now seriously affected by the mildew, and the consequences are beginning to be felt in the markets for lean stock. Six weeks back, when on a visit to Norwich, we saw on the Market Hill a large portion of the lean stock, bearing testimony by their condition to the fact of the pastures where they had grazed having suffered from the cold and dry weather of the spring. Nor do they appear to have mended their prospects for the winter by a migration to East Anglia. No later than last week we heard a large farmer declare that he had bought beasts at such a price, that he should like to have bought more, but for the precarious condition of his turnips. A failure of the turnip crop is a serious matter in Norfolk, not only for its immediate effects, but for its consequences on the remainder of the rotation. No turnips, no muck—no muck, no corn—has there passed into a proverb; and we have often lamented that our agricultural friends of the south-eastern counties, where crops for winter feeding are of such vital importance, have not some other forage plant to fall back upon when the turnip fails. It is true that wurzel and carrots are making their inroads upon the four-course rotation in its purest and simplest form; and that, differing from the turnip in their season for sowing and for consumption, as well as in the mischances to which they are liable, they prevent, in some degree, all the eggs from being in one basket, and that basket rather of a fragile description. Let us suppose that at a meeting of some of our great Agricultural Associations the announcement were made that in an island at the antipodes, under a climate very like our own, there existed a plant which flourished on the poorest soils, which produced a perennial crop

with no trouble of cultivation, and but little for cutting and preparing it for cattle food—that horses were so fond of it that they would leave their corn for it, and that it was equally valuable for the rearing of young cattle—what a sensation the announcement would produce! What thanks would be voted to the author of such a communication, mingled of course with the expression of a sufficient number of doubts, to keep up the character of the objectors for practical wisdom! What efforts would be made to procure the seed and to learn the method of cultivation! What numerous experiments would be tried with it! for he who should succeed in bringing it into general use would win agricultural laurels as brilliant as those of the discoverer. But, alas! how the scene would be changed, when the meeting should be informed that this mystical plant was no other than our time-honoured and ubiquitous friend whom, as old Homer would say, the Gods (that is, botanists) call *Ulex europæus*, and men (that is, farmers) call gorse, whins, and furze, as their own habitat happens to be in the West, the North, or the South of England.

When the gloomy statements of our friend respecting the prospects of the turnip crop were made, we were standing together in a field on the steep side of a sandy and gravelly bank, not worth 3s. an acre for cultivation, but on which gorse was growing in all the luxuriance which it displays in such situations. We therefore ventured, though with some diffidence, to express surprise and regret that a plant which flourishes spontaneously in such situations and in the greatest abundance, and which in other districts was so sedulously cultivated, should be so utterly neglected in Norfolk.

Much to our surprise, we found our friend assenting to our views; and great was the pleasure with which we heard him declare, in corroboration of them, how he had seen horses in the winter bruising it with their hoofs to free it from the spines. We then discussed the various methods open to the farmer for preparing it, and the want of a really good gorse-crusher, and we parted with repeated declarations on the part of our friend, that he would certainly try it this winter.

On the other hand, we have been told of those who have tried gorse in Norfolk, and have found it not to answer. Should this article meet the eye of any one so circumstanced, we shall feel obliged if he will communicate an account of his experiments. We have little doubt the failure will be found to have arisen from the neglect of some apparently trifling details, attention to which would entirely have changed the results. Two of the objections often advanced against gorse as a forage crop, are the following:—It is liable to be destroyed, it is said, by a severe frost. During a residence of ten years in a gorse-cultivating district of North Wales we knew it thus injured once. Still the horses ate it. We do not say that it would have not been better unfrosted. They required more hay cut with it and more corn with it, but still they ate it. How many times during that period has the same mischance befallen the turnips! and is there any farmer who proposes to abandon the cultivation of them on that account? It may be said, however, that the cutting north-east winds of a Norfolk spring are more likely to destroy it than the prevailing winds of the west of the island. Be it so; but is there no way, we would ask, of guarding against this? If at certain intervals the gorse were allowed to run up high as a hedge, it would protect the rest of the crop from these wind frosts. Another objection sometimes urged against the use of gorse for feeding stock is, that it is not a fattening crop like turnips, but a crop for the maintenance of horses and young cattle. And would it be no advantage, we reply, to the farmers of Norfolk to have a crop which would keep their farm horses off the haystack from October to April? Would it be no advantage to have a cattle-rearing crop, instead of being obliged to purchase older beasts, and often to purchase them at a rate which gives the kernel to the breeder, and leaves the shell to the grazier? Are not the breeding districts, which formerly supplied them with beasts, becoming fattening districts as well, and sending their stock up by rail or steamer, dead or alive, to the London markets? Has not the pressure of the change been felt in Norfolk? and have not attempts at rearing stock been made in that county, by keeping the land under seeds two years instead of one? When these attempts have been abandoned, have they not been abandoned for no other reason than the alleged liability of the light soils of the district to become foul during the second year, when they are devoted to grazing? Might not gorse-feeding in the winter, and soiling with clover and with Italian rye-grass in the summer, enable the farmers of Norfolk to rear a portion at least of the cattle required to consume their turnips, and at the same time to increase the amount of their home-made manure, and to reduce their outlay for light manures?

Norfolk is not the only place in which gorse grows with the most splendid luxuriance on the poorest soils, and is neglected as a forage and manure-producing crop. On an Irish estate, to which we have before referred, we lately saw it flourishing with even more than its wonted vigour. The soil was different from that of Norfolk; and yet it was in some respects similar. It differed in this, that the foundation-rock was not chalk, but

slate, belonging to one or other of the three groups into which modern geologists have divided the greywacke series of former classifications; but whether to the middle or lower part of that group must be considered as yet undecided: nor for our present purpose is this of much importance. This slate rock was covered, like the chalk of Norfolk, with deep deposits of boulder clay. These again had been greatly denuded; so that, in some places, the rock comes to the surfaces, while in others it is deeply covered. We saw some sections in which the boulder clay was thirty or forty feet deep. This denuded surface, again, is covered with a loamy deposit of variable depth, its depth varying with the contours or forms of surface. For want of a better name, we may adopt that which has been given to it by the geologists who first drew attention to it, and call it the *warp-drift*. The result is, that over large tracts the subjacent slate rock exercises very little influence, but is covered by a great variety of soils of very different qualities and values. The narrow summits of the ridges, which by some denuding action had been formed in the rock—and they were often so narrow, as to be not more than two small fields in breadth—were overspread with a thin covering of boulder clay, and warp drift, having a surface sufficiently level for cultivation with the plough. On the steep sides of the ridge were other narrow tracts, too steep for the plough. Under the reign of the potato they were cultivated with the spade. Since the failure of that crop, and the rise in the value of labour, they are chiefly abandoned to pasture. As the ridges are descended, the loamy warp-drift deepens; and we have slopes of better and deeper soil, sufficiently level for the plough. These gradually melt off into the alluvial flats bordering the rivers and lakes which occupy hollows between the limestone ridges. These, according to the state of the arterial drainage, and their elevation above it, are either sound meadow, or mowing-ground occasionally flooded, or rough wet pastures, or peat bog.

Leaving these facts, as to the variety of soils and their distribution on the same rock, to the consideration of those cultivators of agricultural geology who insist on the substratal origin of soils, and contend that, given the rock, you know the quality and value of the soil upon it, we proceed to point out those soils and their positions on which the gorse revels in its greatest luxuriance, namely, the steep sides of the ridges, unsuited to the plough. These, when left to pasture, speedily become overrun with gorse. In such a situation, we found a tenant, of more than the ordinary enterprise, who had recently come into the occupation of the land, and was making and contemplating several spirited improvements, in the act of grubbing a splendid crop of gorse, in order to plant potatoes. Here was a spontaneous production of the soil, which, had he known how to apply it, would have been more valuable than any crop he could raise. We urged this point upon him, and others among the tenants, and pointed out the value of the gorse crop elsewhere, touching lightly upon Wales, and dwelling more on its application in the Irish county of Wexford. He and some of the other tenants promised to make the experiment: the probability is that they have not, from want of the means of bruising it. Labour is now too dear for the bruising of it by hand, as practised by the small farmers of Wales. Gorse mills, driven by water, which were formerly much used by the larger farmers there, are beyond the means of most Irish farmers. Even the chaff-cutter, which has in a great measure superseded these mills, when the gorse is used for horses, and in which it is cut up with a little straw or hay, is too costly for them. The same may be said of the best and cheapest gorse-crushers yet invented; and for black cattle the gorse must be bruised. Under the circumstances of the small holdings of Ireland, there appears therefore no alternative but to have recourse to the best hand gorse-bruiser extant, till a better shall be produced, to be worked by men going from farm to farm with their own implement, and bruising gorse by the day or the bushel. And we would venture to suggest to landlords having gorse on their estates in a part of Ireland where its use is not known, that the best way of convincing the tenants of the value would be to keep some horses and cattle to be fed with it, and to purchase gorse of their tenants, by the acre or the rod. For bruising it on a large scale there will probably be no better implement than an old millstone set on edge, traversing in a circle like a cyder mill, and worked by a horse. They might also set up some labourer with a hand-machine, to bruise it for such tenants as might be inclined to feed with it themselves.

We shall be obliged to any of our Irish readers who may see objections to this plan, if they will state what they are. We shall also feel indebted to any of those of the county of Wexford, who are successful feeders with gorse, if they will communicate to us the results of their experience.

FARMING AND STOCK KEEPING IN IRELAND.

A rapid increase is taking place in the size of farms in Ireland. If this were not apparent from the statistics collected by the constabulary, it might be inferred from the fact which has been noticed more than once in these columns, that some of our principal implement makers resort to the agricultural gatherings of Ireland, and are well satisfied with the encouragement which they receive. Small farmers, even in England, are not the purchasers of these. Much less are drills, horse-hoes, clod-crushers, to say nothing of reaping machines and steam thrashing mills, within the reach of the cultivators of ten-acre farms; and an estate in Ireland, on which they average that size, is called a "well circumstanced property." We were lately over an Irish estate, bearing that reputation, where that was the average. There were some holdings of larger extent, and there were many smaller, but that was the average; and there we did not see even so common and necessary an implement as a good roller. There were nothing but the most wretched home-made substitutes, in the form of a badly rounded log of wood or block of stone, without shafts. This consolidation of farms must go on increasing, for wages are advancing; and high wages are unfavourable to small holdings, even when accompanied by high prices of produce.

It was under such circumstances that the smaller holdings in England became absorbed in the large farms at the close of the last century; and that the yeomen farmers sold their paternal acres, to become larger renting farmers under the squires. This consolidation of farms in Ireland must and will go on. It cannot be prevented, as some Irish writers appear to imagine, even if its prevention were desirable. All that can be done here is for the landlords, who will derive benefit from it, to endeavour to smoothe down the transition state as much as possible, and to mitigate by kindliness of purpose — which cannot fail to produce the best influence upon the mind — those hardships which attend all social changes during their progress, however beneficial in their results. On the estate to which we have referred, which was by no means an unfavourable specimen, we found only the most wretched system of cultivation. Potatoes the only fallow crop—repeated corn crops, till the land was thoroughly exhausted, when it was left to lay itself down to pasture as best it might. We saw a few attempts at growing turnips; but, in general, they were miserable failures, from a variety of causes, which had only yielded the fruit which might have been expected from them. The land had been imperfectly prepared, or insufficiently manured; the weeding and thinning of the crop had been neglected; or, from the state of the fences, the cattle of the farmer or his neighbours were allowed to stray over it.

The natural tendency of the failure of the potato husbandry is to convert to permanent pasture such land as is capable of it. The lands in question, however, were not so well adapted to that as to alternate grain and forage crops. In Scotland or England it would have maintained flocks of sheep and herds of cattle. The tenants kept a few sheep; but they were not favourites, on account of their straggling propensities, and the farms were not large enough to maintain them in flocks. With all this the tenants were industrious and intelligent. They appeared to want much instruction in the art of growing green crops, and such an arrangement for the conversion of them between farmers and stock-men, as prevails in some of the best cultivated districts of Scotland. There the farmer confines his attention to the cultivation of his land, letting his grass and green crops by the acre; while the stockman makes it his business to attend fairs and markets, and thus acquires a better knowledge of the value of stock than one who only attends them occasionally,—or if he frequents them much, must neglect his business at home. We have, again, an example of a similar division of labour and economy of capital in parts of Dorsetshire. There the farmer, however many cows he may keep, lets them to dairymen who inhabit the old farm houses. The system works well for both parties. The dairyman has the advantage of the farmer's capital, and can convert the milk of more cows than when he was obliged to buy them for himself. He only requires sufficient money to pay the customary half year's rent, which is paid in advance. The farmer, on the other hand, has the advantage of the skill and attention to minutiæ in the making and marketing of the butter, which can be best bestowed by the dairyman and his wife. We found the germ of the Scottish system in operation upon the Irish property above alluded to, for when we urged on the tenants the advantage of keeping more stock, we were told that they found it more profitable to take in agistment stock than to buy it.

Why should there not be stock-men in Ireland? Why should not the landlord lead the way, by turning stock-man himself, and keeping a flock of

sheep or a herd of cattle on turnips and other green crops, to be purchased of his tenants, and consumed upon the land? On a soil adapted to sheep husbandry he might keep a flock which should not be less than 300. If the land were not of a description on which turnips could be consumed on the ground, he might keep oxen. For this purpose, with a few poles and some rough thatch, he might easily run up some rough cattle sheds in a situation central to several farms, paying his tenants for turnips and straw by the ton, and requiring them to take back manure at a given rate.

We do not expect landlords in many cases to make a profit by their stock-keeping, as such. Their profit would be in its effects on the state of husbandry on their estates. That was the case with the late Lord Leicester. It would have puzzled him, as we know on the best authority, to have shewn a "balance sheet," as much as it puzzles some of our other amateur agriculturists. It was, however, highly remunerative in the improvement it effected in the cultivation of the district, and in the effect of that improvement on his rent-roll.

We shall be glad if these suggestions draw forth some remarks from any of our Irish readers, for we are anxious to know what objections can be raised against the proposed system.

A RAILWAY RAMBLE, &c.

Sept. 15th.—The country along which I now travel is much exposed to northerly winds; but as the bean crops generally are cut, it does not appear to be a very backward district. The soil is fair loam near the Dee, and not bad elsewhere; but the farming is not good. Wheat is put into small "cobs" in the field, preparatory to future stacking, and the corn crop is securely capped in shock. The grazing stock, seen from the railway, between Flint and Mostyn, were shorthorn cattle and Leicester sheep of profitoble character. The district near Holywell is a strong, clayey loam; the harvest backward, much to be cut and lead; the crops fair; the stacks thatched with an unusual profusion of bands, varying from twenty to forty on one side of the roof. At Mostyn we came amongst mines and mountain sheep, the first seen on entering Wales; here the farmers were marling and liming their clovers, and other lands heavily, and ploughing it in. We soon reached Conway, where I quitted the railway for an excursion into the interior, and soon had some fair specimens of Welch farming. The stacks upon the hills and near the mountains were very small, and thatched with the usual profusion of bands made of straw, rush, or sedge, certainly more ornamental than useful; many small "cobs" are seen in the fields everywhere awaiting a favourable time for removal and more secure stacking. The custom of harvesting appears to vary; some crops are mown, others reaped, all capped. On reaching the hills, the only grazing stock to be seen are Welch cattle and mountain sheep. The cattle are useful and well-formed; but the sheep are anything but profitable animals, and are without any of those characteristics denoting thriftiness or inclination to fatten, and the wool very varied. There cannot be much attention given to promote their improvement. The specimens of mountain breeds shown at Carlisle and those seen throughout the mountain districts of Cumberland and Westmoreland are very superior. I had a fair opportunity of becoming acquainted with the North Wales flocks. I passed a few days in the Pass of Llanberris, quitting it on the day of its annual fair. The animals shown are small and misshapen, their best qualification being their adaptation for climbing, leaping, &c., &c., in which they undoubtedly do excel, and of which I had ample proof. It is customary to gather into folds many of the mountain flocks of "Snowdonia" prior to the fair, for the purpose of selecting some for sale; and it was my privilege to be present at one of these gatherings or drawings from on both sides of this most wild and romantic pass. On my right was Snowdon—early in the morning the shepherds with their assistants were heard uttering their peculiar and exciting calls and alarms which came gradually nearer and nearer, till you could see one after another, portions of their flocks springing over the crags and precipices innumerable, and making their way downwards to the sides of the pass, which is here very steep and wild, and I looked up with great interest and wonder to see both sheep and shepherds making their way along what appeared to me almost an impassable track; however, they soon arrived below and were safely deposited in folds of varied size surrounded by high stone walls. This did not occupy much time, and the next and by far the most exciting scene, and I thought attended with the greatest difficulty, was to collect the flocks on the Glydir Mountain, on the opposite side of the pass, which closely approaches Snowdon in elevation (being 3,300 feet high, Snowdon 3,571 feet). The flocks were more numerous and required more help to collect them. I counted twenty-four shepherds and assistants. The sound of their voices

from the comparatively table-land above was heard long before any movement could be observed from the pass below, in which I had stationed myself in company with the chief shepherd or director of the whole movement. He was an old man, the *beau ideal* of his class, and evidently much enjoyed the excitement. The height and rugged grandeur of the mountain sides added much to the scene. After a considerable lapse of time, and as the voices of the men on the mountain appeared to come nearer the awfully precipitous sides, here and there might be seen a few scattered sheep springing down from the very summits of the rocks to crags and clefts beneath, but without any apparent chance of getting further down; presently might be seen the form of a shepherd showing itself very dimly on the heights above, for it required very close watching to discern the figure, such was the commanding height and varied appearance of the crags. Now the voices reverberated along the whole pass, and those above put themselves into communication with my companion below, who by various movements of his body and strength of lungs attempted to show them the almost innumerable clefts and crevices into which portions of the flocks found their way, and which it was impossible to see from above. By degrees the men made their way one after another over the edge of the precipices, and spread themselves at suitable intervals along the sides of the mountain, continually climbing the most abrupt places and leaping down from large crags and letting themselves slide down the steeps. During all this time they were either shouting or throwing stones at the animals, endeavouring to frighten them onwards; and not by any means the least exciting was it to see the wonderful sagacity, not to say skill, displayed by the great number of shepherd-dogs engaged. These sensible quadrupeds enjoyed the *sport* quite as much as their masters, and it was highly amusing and animating to see with what zeal and care they searched around the fallen rocks; and by their barking and running succeeded in bringing numbers into contact, which, as they became more united into one large flock, were driven from rock to rock along this frightful steep, till, amidst much joyousness, they were hemmed in and brought to the required fold. The selection was soon made, and the remaining again turned to their healthy pasturage. The price of the lambs of this district varied from 7s. to 14s., the ewes and wethers from 15s. to 25s. per head. The rule for apportioning or valuing rental in most parts of the mountain pasturage of North Wales is by estimating the number of sheep it will keep per acre, and the price is from 2s. to 2s. 6d. per head; so that the land keeping one sheep per acre would be from 2s. to 2s. 6d. per acre rental—some more, some less. I cannot say much relative to the agriculture of this part of North Wales; it is mostly pasturage with occasional breaks into some retired valley, where apparently such crops are grown as can be most readily obtained, chiefly oats and barley, with patches of potatoes, turnips, &c. These valleys are most enchanting—Llyn-Gwynant valley, "beauty sleeping in the lap of terror," Beddgelert, Aberglas Llyn, Tan y Bulych, Maentwrog, exceedingly beautiful, and through which I travelled by coach, and on again by a most romantic route to Harlech Castle, thence to Barmouth, finishing a most charming day's ride by passing along the beautiful estuary of the Maw to Dolgelly, one of the most richly-diversified rides in the kingdom. There is a rather large breadth of very improvable country by which I passed on my ride to-day. The first portion of it is along the valley of the Traeth Mawr. The breakwater at Port Madoc does great honour and credit to its promoter, the late W. A. Maddock, Esq., and immense wealth accrues through its construction by one source or another; but still much land is yet to be reclaimed or laid dry. Could it not be done by steam-power as in the fen districts? Another large tract of marsh land was on our right as we approached Harlech. This tract appeared to be very imperfectly drained; no large leading drains were to be seen, nor any adequate outlets into Carnarvon Bay. I thought again, here our fen-men would be very useful, they would soon have it properly drained and improved. I could not tell the kind of soil at the elevation on which I travelled; but judging from the number of cattle depastured, I concluded much of it to be good grass land merely wanting security of drainage—it reminded me of the Lincolnshire marshes, but did not appear so valuable. I was told that nearly the whole of this large expanse of water, Carnarvon Bay, was at one remote period enclosed from the sea, and one individual told me he had bathed on the foundations of the old embankment. There does not appear to be much worthy of notice to the agriculturist along the route to Dolgelly, and onward through the beautiful vale of Drws y Nant. Small plots or fields of corn are seen below in the vale, much of it yet to cut, and that harvested is in small "cobs;" capping the shocks general. The mountains on either side appeared to possess more verdure and the flocks more numerous. As we approached Bala the country began to assume a very improved appearance, as regards its agriculture; many respectable farms and farm houses with well cultivated good lands were to be viewed as we passed, and much good grazing land is found in the neighbourhood of Bala. The cattle mostly Welsh; the sheep, Welsh, Leicesters, and half-breds. The country is

rich and fruitful, quite a relief from the rugged mountain scenery and imperfect agriculture I had lately witnessed. My route now lay through the Vale of Edeyrnion, very pretty and picturesque, and increased in beauty as we approached Llangollen; and every spot capable of cultivation was made the best of: and the beautiful vale in which stands Llangollen seemed doubly interesting, from the efforts made to advance its culture amidst so much that is valuable in its iron smeltings and its forges, and enchanting in its scenery.

September 16th.—From the beautiful Vale of Llangollen, with its stupendous aqueduct and still more stupendous viaduct, the wonder of all beholders, I soon passed "Offa's Dyke," the boundary of the principality, and entered the county of Salop. As we proceeded the agriculture gave evident indications of a successful progress. Between Chirk and Wellington the harvest was up, the stacks round and oblong, with moderate roofs simply thatched. The cattle mostly shorthorns, and dairying pretty general. The fields very small, and many hedges and fences. Clovers, seeds, and grass lands limed and dunged. Turnips fair crops, swedes thin and late, potatoes diseased, grass plentiful. The land good, but not well farmed. The prevailing breed of sheep Shropshire Downs, which are large and well formed. As I proceeded I found the breeds of cattle intermixed, and some herds of cows of various breeds, but good of each kind. Fields still small, but more grass land; the arable land not so well farmed. The turnips indifferent on clayey loam, apparently badly drained. Marling grass lands prevalent. The pigs seen along this line are all in character, and similar to those found throughout North Wales; the colour white, of good size and quality, and known as "the small breed" through the country. Approaching Wellington the stacks partook of the Mid-Lothian character, neatly-made round ones; the crops mown; the land twitchy; the fields very small, long, and abounding with hedges and hedgerow timber; the country level, much richer, and more grass land; harvest not finished, some oats stacking near Rednal. Half-bred sheep were seen near here and Banchurch, apparently Downs and Shropshires. The country becomes wooded and gently undulating; the land rather foul; the corn all mown; turnips bad; the soil clay, with plenty of stones (clayey gravel); potatoes bad, but not many grown; clovers thin; some fields of beans near here; harvest not in; one field of wheat not ripe. Corn-ricks seen as we near Wellington; country and farming much better; cattle Shropshire longhorns; sheep not numerous, but chiefly Shropshire Downs and half-breds. On leaving Wellington we were soon in the mining district. At Newport passed some good grazing lands and herds of Devons fatting thereon. The soil near here a red sandy loam. Some wheat yet out and capped; manuring seeds for wheat. The sheep here appear to be the Leicesters and Shropshires; seeds thin; turnips fair; district altogether more undulating and attractive; fields small, land fair and fairly farmed. Gnosal—Some good grass land to the left, but not well grazed. Turnips good, and bean crops fair near Hauchton. As we approach Stafford the country becomes higher; the soil a clayey loam; lands or stetches small, but looking wet; wheat, beans, oats, and barley grown free here; turnips good. On nearing Stafford we come to the red land again, and much good grass, on which are grazing good shorthorns. The corn stacks retain a similar character along this route as those last-named, *i. e.*, round and oblong. The country from Stafford to Tichfield appears good, well farmed, and rich in woodland scenery. I reached Tamworth from Lichfield too late to make remarks by the way, which ended my fifth day's ramble.

September 17th.—I left Tamworth early, and proceeded by the Trent-Valley Railway to Burton-on-Trent. My first remark was three horses in length at plough on sandy land—a waste of power, and at all events, just now unnecessary; the soil good "red land" around; the fallows mostly bare, lime used; the soil strong clay, with stone; wheat yet out. We soon come to a better district and more expansive; the soil red loamy clay, upon which they use lime. A good deal of grazing land, not strong, but healthy and well adapted to the dairying carried on around or near Bagworth; Leicesters, large kind; stacks hip-ends throughout; the turnips good. As we proceed we find better grass-land; the soil lighter coloured clay; more tares for seed; fields too small. Again we come to better grass-land and good shorthorn cows. I find some black longhorns near here, and Leicester sheep appear to improve in breeding as we approach Desford, where I find many good shorthorns, and am quite in a dairy district, and much good grazing land is everywhere seen with fair pasturage. Beans are grown, and manure is laid on seeds and dead fallows for wheat along this route. Some wheat is in shock, and the stubbles not clean; the swedes are good. I saw here five horses in length with two men working the soil. Scarifying adopted when lands are cleaned. Braunston we come to limestone. Good dairies of cows as we pass along; corn crops in and scarified; beans out; clay light-coloured; dead fallowing practised; much good grass land; large Leicester sheep; good seeds; good shorthorns, and richer lands; turnips good. As we proceed to Leicester the land is still better, and in the valley the land is of first quality and of great value. The pastures

by which I have passed from Lourton to Leicester have hitherto been fair, but I begin to notice a falling off in the quantity of grass.

The valley in which the town of Leicester is situate is very rich and fertile, and would bring the most splendid crops under culture; it is principally devoted to grazing, and much cattle of various breeds are fatted on its beautiful pastures. Potatoes grown sparingly; swedes fine; mangolds good; grass rather bare. On passing on towards Melton, I observed some rye sown; the wheat is usually reaped and stubbles mown, the beans in shock, and crops good. The Leicester sheep are here large and good, and in one case a field of green-globe turnips was being fed off on the adjoining grass land, such is the scarcity of grass here. The harvest all in except beans. The soil on one side the railway red loam, the other loamy clay; cuttings deep through red earth or marl; the corn stacks are here round, the hay stacks oblong. Swedes continue to be good, as we pass on to Syston. Now very few stacks are to be seen, and stacking on hovel posts becomes general, oblong-shape thatched with four bands. Saw the first crop of cabbages since I set out; potatoes more grown, the haulm diseased; some lands well worked after cleaning. This is a very good district for farming or grazing; the land along the river very rich. The sheep are large Leicesters; cattle chiefly shorthorns; the fields large and square. At Rearsby some of the grass land appears to be badly drained, but good though bare of grass. All along a fine breadth of grass land of excellent fatting quality, with a fine stream flowing through. Saw some good Herefords, but shorthorns are chiefly grazed. The herbage is very bare all the way to Brooksby; the grazing land of equal quality, but not so clean. Shorthorns and Leicester sheep chiefly seen. In a field to the left some Herefords fatting, and here I saw cake-troughs in the fields for the first time in my ramble; all the pasture is very bare, and sheep taken off. All good pasture land near the railway, but plenty of corn to be seen in the distance. The land as we pass along appears to be all drained. Now we come upon some sheep and Hereford cattle again, but mostly shorthorns. As we approach Kirby the country altogether presents a richer appearance; good farmhouses and farmsteads, good land, good stock, and good crops. The high lands appear to require better drainage; the cattle shorthorns; sheep Downs and half-breds; long manure is being applied to seeds for wheat; turnips good and not mildewed; stacks chiefly oblong, not high, some with hip and some round. As we proceed the soil is found to be reddish, with plenty of stones. Here loose barley was being stacked; some large dark-faced Downs grazed; lime used freely. Again we come upon some good farms, containing good clay loam, growing good crops of beans and turnips with long rows of barley stacks, and fields of shorn wheat, leaving a good clean stubble, and fields of large extent. The hills appear to be red land, the valleys clay. At and near Oakley we come upon much good grazing land, but not well grazed; the stock shorthorns, Downs, and half-breds. The country now is nearly all flat, and looks rich and fertile; capital turnip crops, not many potatoes. How is this? What is seen looks well. Sheep now assume more Leicester and Down half-breds; soil strong clayey loam; stacks chiefly oblong, and I again notice the profusion of bands used in thatching—they have much fewer since I left Wales. As we proceed I notice the fields are smaller and land stronger in staple; four horses to draw a common plough; the stacks vary more in form; the wheat is mown, and nearly all the harvest in; some scarifying stubbles along the route. As we approach Burton the harvest appears to be later, as the barley is not all mown; but the crops are heavy, stubbles strong in the district, and rather foul. The cattle good, shorthorns; sheep, Leicesters and half-breds. I was delighted with the natural richness of the valley over which I have just run from Tamworth to Burton; it appears capable of sustaining any order of culture, or it will fatten an immense amount of stock with a little artificial aid. I speedily left this route for Leicester. The immediate vicinity of Burton appears to be a little over-cropped, judging from the twitchy state of the fields; the soil a strong clayey loam and crops good, but foul stubbles. We pass many good shorthorns on this route. We soon reach the hills. The farms now appear to be of rather large extent; capital turnip crops on the hills, but the drainage appears defective below; rather heavy loam, with light-coloured clay at top in many places; stacks all low, some hip-ended, with bands in great numbers in thatch. Some good swedes near Gresling. The soil here a light-coloured clay and very strong in Leicester sheep; wheat shorn; stubbles foul; barley stacked loose. As we go on, the land seems poorer, the corn still out. We come upon the mines near Moira. Country poor; crops bad; turnips very bad; cattle shorthorns; sheep Leicesters, half-breds; some bean crops; some good land in the bottom on the left. Soon arrive at a better district: land good; the first shorthorn herd of cows seen here. The wheat is shorn, and all well done. We presently reach Ashby-de-la-Zouch, a beautiful country for farming; the land around rich and good, but most of the harvest is still out. Good Leicester sheep. Soon get to a higher country through deep cuttings; the soil various, but not so good; rather light, or clay and sand. Soon over another valley; saw six horses dragging a scarifier;

half-bred sheep; cutting, red clay; pleasant undulating country; another herd of cows; land scarified with a Bentall; soil red loam. Swanington and Coalville coal mines: tares sown for seed; wheat mown, much to stack; stubbles foul. Bardon Hill, rather good flat or valley; turnips fair; crops bad; where cleared all scarified; three horses in length and two men to scarify barley and seed; stacks all thatched at the end, for miles. What a beautiful stream on our left all the way! and beautiful land, but still no grass. We pass some rushy grass land, and Lincoln long-wools or Leicesters of unusual size; turnip crops fair. Kirby Park, and lands all around, very fine. Soil deep, clayey loam; the grass rather better, not so bare; shorthorns and handsome Leicesters grazed. The corn stacks are not well built and the thatching slovenly, eaves not cut. The same beautiful grass land prevails tilltwe come to Melton Mowbray. This appears to me he finest district of grass land over which I have passed during my ramble, beginning at Syston and closing with Melton.

My route now was to Stamford. On immediately quitting Melton the grass land holds its character, and the fields have a nice incline or slope; but I soon came to a colder and poorer country, where I saw corn out and beans not ripe. There is much grass land right and left, which ought to be converted into tillage. Some good grass land as we approach and pass round a large park, which is itself good, but not well grazed; herbage bare, looks thin soil, and clay bottom. Near Saxby are large tracts of grass land right and left, not first quality; should be arable; shorthorns and Leicesters grazing in it. Some dead fallows; wheat uncut and much corn out; beans not ripe. How is this? A fine open country, so late with harvest. Much grass land as we pass along, looking sadly. Whissendine—More corn out along this district than I have seen elsewhere in my route. Much wheat yet to cut; grass lands look poor and bare. The soil for some miles along, over which we are passing, is clay, apparently undrained, which will account for its backwardness. Stacks all old-fashioned, not much care bestowed. Ashwell—This is better and better farmed and crops good; grass lands well grazed; some very good, but bare; a pleasant farming district; clayey loam, but not strong; too much grass land. Oakham—Good grass land and well grazed; all shorthorns and Leicesters near here; beans not cut, and barley yet out; too much grass on all sides. Corn still out, as we pass along; beans yet green; grass still poorer and rushy. Three-fourths of the district grass, and not good, and very bare. Why is this, I ask again? Luffenham—Here are still to be seen the remains of barbarism, *i. e.*, large unenclosed heavy land fields, the only ones I have seen, except Chat-moss and the Welsh mountains. Harvest is not finished here. What a species of thraldom and petty tyranny must exist here! Kelton—This is pretty, and nicely farmed lands look well. Stamford—Here I finished my sixth day with a pleasing walk in the delightful park of Burghley House, the seat of the Marquis of Exeter. The park is rich in verdure, as also in woodland beauty, the herd of Shorthorn cows, superior to any I saw along my ramble, the fatting cattle excellent, the Leicester sheep of capital quality and fine symmetry, and the half-breds very good, but not large.

This "ramble" must be taken as mere "Pencillings by the Way"—which will, I hope, suffice as an explanation for its irregular and disconnected observations.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The first Monthly Council, after the autumn recess, was held at the Society's House, in Hanover Square, on Wednesday, the 7th of November. The following Members of Council and Governors of the Society were present: Lord Portman, President; Lord Berners; Sir John Villiers Shelley, Bart., M.P.; Sir Charles Gould Morgan, Bart.; Sir Archibald Keppel Macdonald, Bart.; Mr. Dyke Acland; Mr. Raymond Barker; Mr. Barnett; Mr. Barthropp; Mr. Bramston, M.P.; Mr. Bullock; Mr. Cavendish; Colonel Challoner; Mr. Druce; Mr. Garrett; Mr. Brandreth Gibbs; Mr. Fisher Hobbs; Mr. Wren Hoskyns; Mr. Kinder; Mr. Lawrence; Mr. Miles, M.P.; Mr. Milward; Mr. Mainwaring Paine; Mr. Allen Ransome; Professor Simonds; Mr. Simpson; Mr. Thompson; Professor Way; and Mr. Jonas Webb.

The names of 42 candidates for election at the next meeting were read.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, reported that the current cash-balance in the hands of the bankers was £1,048. He also laid before the Council the Committee's monthly report on the accounts of the Society, along with the usual quarterly balance-sheets.

Carlisle Meeting.—Mr. Simpson, Senior Steward of Cattle, and Mr. Fisher Hobbs, Senior Steward of Implements, made reports connected with their respective departments at that meeting.

Trial of Reaping Machines.—Mr. Raymond Barker moved, and Sir John Shelley seconded, a cordial vote of thanks to Mr. Miles, M.P., for the liberality with which he had placed his crops, as well as his men and horses,

at the service of the Society, for the subsequent trial of the reaping-machines selected at the Carlisle Meeting; and for the kind hospitality with which he received at Leigh Court on that occasion the various officers of the Society connected with that trial.—Mr. Miles acknowledged the compliment so handsomely paid him by the Council, and expressed the satisfaction it would at all times give to promote in any way the objects and welfare of the Society.

CHELMSFORD MEETING.—Mr. Fisher Hobbs, as connected with the local authorities, called the attention of the Council to the necessity of every requisite arrangement being made by the Eastern Counties Railway Company for the accommodation of visitors, and the reception of stock and implements, at the Chelmsford station.

PARIS SHOW.—Mr. Evelyn Denison, M.P., English Commissioner at the Paris Exhibition for Agricultural Implements and Machinery, transmitted an interesting report of the results of the trials; and of the very important step which, he considered, had been taken in France by the change of duty on English agricultural machinery imported into that country.

Mr. Herbet, Consul-General of France in England, transmitted to the Council a supply of the prize-sheets of the exhibitions of breeding stock, and of agricultural implements and products, to be held at Paris in 1856 and 1857: these prize-sheets containing new and enlarged classes for the different breeds of English live-stock. The Consul-General has further favoured the Council by stating, that by the imperial decree of the 29th of August last, officially published at great length in all its details in the *Moniteur*, and modifying the import duties generally of machinery, implements, &c., the following rates have been fixed for *agricultural* implements and machinery :—

Agricultural machines (not including steam-engines) ..	15 francs per 100 kilog.
Reaping-machines	120 francs per 100 kilog. (Or, in English value, 6s. per cwt. for the first class, and 48s. per cwt. for the second).

Mr. Miles, M.P., took that opportunity of briefly stating the satisfactory results of the Society's deputation to Paris, of which he, as the President of the Society, had been the head. As soon as the details were completed he would lay the report before the Council.

TRUSTEE.—On the motion of Mr. Milward, seconded by Mr. Jonas Webb, Lord Berners was unanimously elected one of the Trustees of the Society, to supply the vacancy created by the lamented decease of Mr. Pusey.

Mr. PUSEY.—On the motion of Lord Portman, seconded by Colonel Challoner and Mr. Raymond Barker, the following resolution was carried unanimously:

> "That a letter be written to the family of the late Philip Pusey, Esq., expressing the gratitude of the Royal Agricultural Society of England for his services as Chairman of the Journal Committee; and their great sorrow for his early death. That it be engrossed on vellum, and signed by the President, with the seal of the Society attached."

IMPLEMENT-MAKERS.—On the motion of Mr. Ransome, seconded by Mr. Garrett, a conference between a certain number of the Implement Manufacturers who were exhibitors at Carlisle, and the Implement Committee of the Society, on certain points affecting the future regulations of the implement-department at the Society's country meetings, was granted by the Council, and fixed to be held on Wednesday, the 5th of December, at 1 o'clock.

Numerous communications, received from the Foreign Office, were referred to Prof. Way; for which, and other miscellaneous communications, the thanks of the Council were ordered: when the Council adjourned to their monthly Council on the 5th of December, and a Special Council (for any overstanding monthly business) on the 12th of December.

HOW FAR WILL THE COLLECTION OF AGRICULTURAL STATISTICS BE PRACTICABLE OR USEFUL?

We noticed, immediately on the publication of the report, the very palpable omission in the evidence taken by the Lords' Committee on Agricultural Statistics. The class above all others interested in the inquiry, and upon whom the development of the scheme must mainly depend, were allowed but little voice in the discussion. To say the least of it, this was impolitic. Any really practical measure could but have benefited by such testimony; while we may reasonably assume that men will be far more ready to acquiesce in any proceeding upon which they themselves have been consulted. The physician who prescribes for a patient without seeing and ascertaining from himself what his symptoms are, is hazarding at best a dangerous experiment. He is allowing, too, neither fair play to one nor the other, for the exercise of his abilities or the requirements of the case.

Under such circumstances, it is not uncommon to find a man take the matter into his own hands. The agriculturists of this country are now doing so. They are consulting one with another as to what may come of, or be done with this question of statistics. In doing so, it is remarkable to observe how readily they arrive at sound conclusions. Reason as logically as the best of us will, it is next to impossible to devise anything feasible or trustworthy without the co-operation of those practically and directly interested in the subject. It is so in this instance. Subjoined is the report of a debate which occurred incidentally a few days since at a local meeting in Lincolnshire. It reads to us as amongst the most valuable evidence we have yet had as to the extent to which the statistics of agriculture can be obtained or relied on. There was not a speaker but was

of "authority." The argument, indeed, was maintained by some of the best land-owners and occupiers in the kingdom. It was, however, by no means one-sided. There are gentlemen even in the best districts of Lincolnshire who think we should be quite as well without these statistics as with them.

The discussion, in fact, opened in this wise. Sir Montague Cholmeley, though speaking himself as a landlord, seems afraid the publication of statistics would tend to open the landlord's eyes a little too widely, and so to make him a little too hard on the tenants. In his own words, when he found any one of them producing a great quantity of wheat, he would naturally say, "Confound that fellow, he doesn't pay half-enough rent!" This deduction is curious enough, while it goes to show in what utter ignorance we may be as to what our neighbour is doing. Here, in London, many of us will live for years without precisely knowing who or what his next-door neighbour is. In Lincolnshire it seems much the same. The landowner does not appear to have much knowledge of what is being done with his own, until the Government kindly offers to supply him with the information. Then he says, "naturally enough, 'Confound those fellows, I must raise their rent.'" It would, no doubt, be very monstrous to assume that the lord of the soil, or his agent, could, or should, or did, make himself acquainted with the fact of how much of the soil was growing wheat. It would be far more monstrous, as we take it, to assume that he did not. Grant this, however; say there are gentlemen so singularly indifferent: what would these statistics do individually towards enlightening them? Nothing. Would the tenant deliver the Government return paper to his landlord or to the Government officer? Would he address himself especially to the former as to what was his acreage in wheat, or even as to what might be his estimate of the yield? Not a bit of it. If these returns are taken as they should be, Sir Montague Cholmeley will have no more opportunity of obtaining any information as to what his own tenantry are doing on his own property than will the Emperor of all the Russias, or the Governor-General of India.

It is but right to say that beyond the precedent of his honourable friend, Mr. Packe, Sir Montague found but little support in this doctrine of "wholesome mystery." The more important part of the discussion went not on the policy of obtaining statistics—the Lincolnshire farmers are tolerably well agreed on that point—but rather as to what extent they could be collected, so as to be of any real service to the country. The question here is simply one between estimates and facts. The Caistor meeting, it will be seen, went pretty generally for the latter. To supplying what they actually know themselves they make no kind of difficulty. Let a proper officer ask for the acreage under each description of crop, and he shall have it. This, we have always maintained, is the very heart of the whole inquiry. Beyond it all must be guess-work, and very rough guess-work, too. The Lincolnshire farmers coincide very much with this. They would have their part of the business confined to the facts, and depute to others the task of supplying from more general information the estimates of what their acreage may produce. At best, as we often before this had occasion to show, do it as you will, this can be but a matter of uncertainty.

It is not merely remarkable, but it is, as we imagine, of significant importance to see how strongly the agriculturists of Lincolnshire agree as to one point, and how generally they discourage the other. "I believe," says Mr. Banks Stanhope, "the wisest thing we could do as a community, and I am speaking now as a farmer like yourselves, would be to assent and say, We will do it as far as is practicable, and we will inform you clearly and fully the acreage we hold of every sort of crop. But I confess that I think the plan which has been tried in Scotland, and which will no doubt be tried here, of calling upon the farmer to make a return of the produce per acre, is objectionable, *because I think it impracticable.*" Again, says the chairman, Mr. Heneage, "If this were merely confined to an inquiry of the extent of land on which corn is grown, I am sure that there would be no great objection to supplying the information. At the same time to ask any person to give the exact quantity of corn grown on his land is, I think, next to impossible." Mr. W. Smith believes "it would be impossible for farmers to give an accurate notion of what their crops would yield, and that if they were compelled to furnish an estimate, it could not be relied on." And Mr. Torr emphatically concludes the discussion in this wise—As a farmer he had no objection whatever to make a return of the number of acres he had in wheat, oats, barley, peas, the proportion of land cultivated and uncultivated, the quantity of stock he had on his farm, the number of sheep and fleeces of wool; but he should make a great objection to giving a return of the quantity to be produced on his farm, not only on the ground of such an inquiry being inquisitorial, but because the result would not be truthful. "He would repeat that he did not think farmers generally would make any serious objection to giving a faithful return of the acreage, but he would advise them not to encourage at all the proposal to procure returns of the quantity to be produced—not on the ground that such an enquiry would be inquisitorial, but that its results would not be truthful."

We recommend the report of this meeting at Caistor not only to the attention of our readers generally, but to those especially who may be in any ways instrumental to the establishment of Agricultural Statistics.

CAISTOR PLOUGHING MEETING.

This annual meeting was held on Wednesday, the 7th of November. The ploughing, which took place in a field on the farm of H. G. Skipworth, Esq., at Rothwell, was witnessed by a large number of landowners and farmers resident in the neighbourhood, who pronounced it never to have been better. The number of competitors was 61, and the judges had a very difficult task to discriminate between the relative merits of each.

The meeting was in every respect a most successful and gratifying one, and the number of influential people it brought together evidenced the general interest which is taken in it, and the appreciation of the benefits which it undoubtedly confers upon the agricultural community of the district.

The annual dinner of the members and friends of the society was held the same day at the Red Lion, Caistor, to which about 60 gentlemen sat down, presided over by G. F. Heneage, Esq., M.P., the President of the Society for the year, who was supported on his right by G. Skipworth, Esq., High Sheriff, and J. B. Stanhope, Esq., M.P., and on his left by Sir M. Cholmeley, Bart., and the Rev. Mr. Andrews, of Claxby. The vice chair was occupied by W. Torr, Esq., of Aylesby, the able secretary, and nearly all the influential agriculturists of the district were present.

After the usual loyal and national toasts, Mr. SKIPWORTH, in replying to "The High Sheriff," said: There was one question—the education of the children of the lower classes—which was generally brought up at agricultural meetings, and very general and just regrets were expressed that the children were sent out to work at so early an age, and were thus deprived of the chance of receiving an education. He did not, however, see clearly by what means this evil could be remedied, so long as parents were ready to send their children out, and so long as persons were anxious to give them work and pay. The only possible way in which it could be prevented was by compulsory legislation. Another evil was the system of hiring servants without characters. He did not think that it would be difficult for the masters of the district to agree that in no case should they hire a servant without a character, verbal or written, from his previous employer. If they could only get the labourers to value the possession of a character, a great deal would be effected towards curing them of their present apathy, and imbuing them with an interest in the welfare of themselves and their children.

Sir M. CHOLMELEY, who proposed "The Lord-Lieutenant," said: Allow me to say a word upon another question which has been mooted just lately by an hon. friend of mine in a neighbouring county (Mr. W. Packe, M.P.) and which I know is rather a vexed question—agricultural statistics. There was a very wise man, we are told, called Sir Roger de Coverley—though I believe he was only a supposititious personage—who was famed for his wise sayings, though now he is rather known by some merry dances. One of his sayings was that there were many things on which there was a great deal to be said on both sides. Now, on this question I think there is a great deal to be said on both sides. I am not going, therefore, to give a very decided opinion on the question, though I cannot help thinking that farmers ought to hesitate before they give an enthusiastic applause to the proposal made for the collection of these statistics. I think there is a little wholesome mystery in all trades, but we cannot conceal from ourselves that there is a great disposition to treat agriculture as a commercial question, the English of which is—though I don't think we should come to that in this county—that the wits of the landlord are to be pitted against the wits of the tenant to see who can get the most, one out of the other. Now, gentlemen, you must be aware that landlords can't help turning their eyes with a considerable degree of curiosity to every bushel you grow on your farms; and if there were such a system as has been proposed, you may imagine that when a landlord, who had for a tenant a first-rate farmer like my friend Mr. Kirkham here, found that his tenant was producing a great quantity of wheat, he would naturally say, "Confound that fellow! he doesn't pay half enough rent!" and on the other hand, if he found from the returns that there was a tenant who did not get more than a couple of quarters an acre, he would say, "Confound that fellow! he can't manage his land at all; I won't stand, that and I must turn him out." Therefore, gentlemen, though, of course, if the system which is now proposed should ever become the law of the law, you would bow with submission to it sensibly as you did to the repeal of the corn laws, yet I must say for myself that I should hesitate very much indeed before I gave it my adhesion. (Cheers.)

Mr. J. B. STANHOPE, M.P., in responding for "The County Members," after referring to the war, said: There is another question to which I should like to allude, because I agree with Sir M. Cholmeley that it is a very important one, and that is the question of agricultural statistics. We cannot disguise from ourselves the fact that that is a question which will be taken up, and I think it is most important not only that your representative should form an opinion upon that question, but that you yourselves, who ought to be more qualified to form an opinion upon it than I am, should, as a farming body generally, take that question into your consideration, and give expression to your opinions with regard to it. I think the question of agricultural statistics may be divided into two heads. The first head is—the obtaining from every farmer, by a compulsory method, a return of the acreage of corn, roots, and whatever he has upon his farm. Now, I confess that upon that point I don't see any objection at all, and I feel quite certain that something like that is sure to be done, and I believe that by far the wisest thing we could do as a community—I am speaking now as a farmer like yourselves—would be to assent to that, and say, "We will do it as far as is practicable, and we will inform you clearly and fully the acreage we hold of every sort of crop." (Cries of "Hear, hear," and "No, no.") I will give you my reasons for it, and then if any one will give me his reasons against it I shall go away better informed than I came, as your High Sheriff has said. My reason is that it is certain, from what I can see is the feeling of the country and of parliament, that something must inevitably be done with this question. We ought, then, to see in what way we can frame a measure which will satisfy the country and be of advantage to it, and not do harm to ourselves. Now, I don't see what harm can happen to any tenant farmer, here or elsewhere, if the acreage of his corn should be known to anybody else. I don't say that he should tell whether he is growing good crops or bad crops, or making money or not, but that he should simply state the amount of land which he has under different sorts of crops. But I confess that I think the plan which has been tried in Scotland, and which will, no doubt, be tried here, of calling upon the farmer to make a return of the produce per acre, is objectionable, because I think it impracticable. I do not believe that, if it be a voluntary return, you would get many people to make it, and I do not believe you could compel people to make it. I think that is a thing which I should be disposed to object to.

Mr. W. SKIPWORTH, in proposing the health of the Chairman, said, as to the question of agricultural statistics, he thought Mr. Stanhope was right in thinking that there was a strong feeling throughout the country on that subject, and that the Government, considering itself responsible for finding food for the people, was anxious to ascertain whether there was sufficient food by calling upon farmers to furnish returns of the quantity which they produced. He (Mr. Skipworth) thought that the Government had not shown any favour to agriculturists, but had rather turned its back upon them, and had not treated them with that courtesy and respect which it paid to other classes of her Majesty's subjects (Hear, hear, and laughter). First, the Government took away protection (laughter); then it doubled the malt-tax and the income-tax

(Hear, hear, and laughter); and now it wanted to make use of farmers in order to get these statistics. He was quite sure that if such a measure were proposed to any manufacturing class, it would be at once declared most inquisitorial (cheers), and there would be meetings and petitions in order to put such a pressure upon Government as to compel the abandonment of the scheme(Hear, hear). However, if it must come, the question was how was it to be done? The only way it could be carried out was by appointing—not parish-officers, as had been proposed, but independent parties, to visit every farm and to give an estimate of the produce. The acreage alone would be of no use for the purpose of calculating the amount of food provided for the people, because there was the greatest difference between the produce of one farm and that of another, though of the same size.

The CHAIRMAN, in acknowledging the toast, said: The question of agricultural statistics is a very interesting and important one, and deserves the fullest consideration. It has been stated by one of the Members of your county that there is a general feeling and desire to obtain more accurate information of the quantity of corn grown in this country. Now, if it were merely confined to an inquiry of the extent of land on which corn is grown, I am sure there would be no great objection to supplying that information. Indeed it is already supplied in the work issued by the Society for the Diffusion of Useful Knowledge, which gives a rough estimate of the number of acres under cultivation, and the proportion supposed to be under the different kinds of grain. I cannot see any great objection to such a return, in order to show how much land is now cultivated that was some time ago lying waste. We know that our population has, since the year 1801, increased some 60 per cent.; and it would certainly be desirable that there should be a corresponding increase in the quantity of corn grown, and I cannot think there would be any disadvantage in ascertaining whether that increase has taken place or not. At the same time to ask any person to give the exact quantity of corn grown on his land is, I think, next to impossible. You cannot well resort to any compulsory proceeding; it must depend entirely upon the free will of the farmer. I think, therefore, that having obtained the acreage, the only plan the Government can adopt would be to send persons round the country to ascertain, according to their notions, what was the amount of produce, so as to satisfy the people against any apprehension of scarcity. It is entirely a question of degree, and I am really not now prepared to say to what exact extent the measure which has been proposed should be assented to or rejected. I am quite sure, however, that no landlord wishes to be too inquisitorial about the corn grown by his tenant. If he knows anything about agriculture, and pays that attention to his land which every landowner ought to do, he can see at once the difference between good and bad farming, and can guess very nearly how much corn his tenant produces. There is a feeling in the country, and I think also in this room, that the people should be able to form an idea of the provision made for supplying them with food, and that the agriculturists should not endeavour to make too much of a mystery of that which after all is not much of a mystery (Hear, hear).

Mr. W. SMITH, in proposing "The Judges," expressed his concurrence with the views of Mr. Heneage and Mr. Stanhope on the question of agricultural statistics, and observed that it was impossible for farmers to give an accurate notion of what their crops would yield; and if they were compelled to furnish an estimate, it could not be relied upon, and would, therefore, be of very little use in assisting the Government to ascertain the amount of food produced in the country.

Mr. KIRKBY did not think there was, in that neighbourhood at any rate, anything to apprehend, if the landlords knew the crops grown by their tenants, because there was generally a good understanding between the two classes; and the landlords knew very well that though their tenants might get good crops, and though prices might be high, yet that these crops were not secured without a great deal of expense. He did not think that they had any reason to fear that the landlord would take any advantage of the tenant in such a case.

Mr. TORR, in responding to the compliment paid him, said, with the question of agricultural statistics, which had been referred to, he might assume, without any vanity, to be pretty well acquainted. When examined before a committee of the House of Lords he felt a great anxiety not only that he should represent his own opinions correctly, but that he should not compromise the sentiments of his fellow-farmers. The first question was—whether the inquiry ought to be compulsory. He was decidedly of opinion that it ought to be compulsory; for if it were left to the option of the farmers, the good ones would make a return and the bad would not. Then came the question whether the return should be simply of the number of acres under the different kinds of grain, with the quantity of stock kept on every farm, or whether it should include the quantity of wheat grown. He said that as a farmer he had no objection whatever to make a return of the number of acres he had in wheat, oats, barley, peas, the proportion of land cultivated and uncultivated, the quantity of stock he had on his farm, the number of sheep and fleeces of wool; but he should make a great objection to giving a return of the quantity produced on his farm, not only on the ground of such an inquiry being inquisitorial, but because the result would not be truthful. He told the committee that in his county they employed the cleverest men they could find as tenant-right valuers to ascertain the value of out-going crops, and that the very best men often made very great errors. He defied any man to ascertain with anything like correctness by looking at his crop the quantity of corn grown upon his farm. Supposing a man came within a sack per acre in his estimate of the produce, that difference all over England would amount to more than the quantity we imported from foreign countries. A return, therefore, of the quarters per acre could not be relied upon, in consequence of the discrepancies between different valuations, and no possible useful result could be obtained. He noticed that Mr. Caird, who was considered by some people, and particularly by *The Times*, to be a great authority on agricultural statistics, acknowledged the value of the acreage return, but did not feel much faith in the returns of the produce. There was one important point in connexion with this subject which had not been treated upon—the return of stock upon farms. At first blush, this might not seem to be of any material advantage, but it should be remembered that the quantity of stock kept in a district was a great means of estimating the extent of the cultivation; for if there was an increase of corn on the one hand, there was generally a diminution in the quantity of stock, of one description or another, and *vice versa*. This was illustrated by Ireland, where, during the last four or five years, owing possibly to some extent to the emigration of so many of the labouring population, the cultivation of wheat had decreased very much, but the quantity of land stocked by cattle and sheep had very much increased. Thus one thing told upon the other. Now, he believed that the English farmer would not object to the measure now proposed if he could feel that it would produce a truthful result. He could give an accurate account of the proportion of his land which was under different crops; but it was impossible to estimate the amount which those crops would yield. There was no greater proof of this than last year's harvest and this year's. Last year he (Mr. Torr) was asked for a report for Liverpool, and he said he believed England would grow more wheat in 1854 than it had ever done before. That prediction was, however, contrary to the opinions generally held at the time. In a report which he had written this year, he stated his belief that the crop of 1855 would produce nearly one-fourth less food for the people than that of 1854. But what notion could the statistics have given of such a fact? There was just as much straw this year as last, and, in many instances, as big-looking crops; but they had not yielded so many quarters per acre. The *Times* newspaper just now was endeavouring to write up the present crop, and last week he was very much astonished to see in that paper a letter, signed "A Lincolnshire Vicar;" but all he (Mr. Torr) had to say was, that if the writer of that letter had no greater knowledge of the wants of his flock than he had of agricultural statistics, his flock was very much to be pitied. (Cheers and laughter.) He (Mr. Torr) would repeat that he did not think farmers generally would make any objection to giving a faithful return of the acreage, but he would advise them not to encourage at all the proposal to procure returns of the quantity produced—not on the ground that such an enquiry would be inquisitorial, but that its result would not be truthful.

THE NATIONAL NECESSITY FOR AGRICULTURAL STATISTICS.

The subject of agricultural statistics has at length engrossed a considerable share of public attention. We have ever been of opinion that, in point of importance, it is second to no other department of statistical information derived in this country, and which a glance at its various bearings will prove.

If in a ship at sea apprehensions had arisen that the biscuit would not hold out to the termination of the voyage, or if in a fort beleaguered by an enemy the provisions had fallen off in supply, it is obvious in both instances that the immediate attention of the commanders would be directed to an inquiry, for the purpose of ascertaining the amount of provision in hand, and, by comparing it with the daily consumption then going on, so adapt the means to the end as to enable the difficulty to be met, or so far mitigated as to ensure the persons interested from the effects of starvation. When, however, the welfare of a nation is at stake, this has been left to the chapter of accidents for righting itself; and thus the greatest misery has been frequently produced to millions whose dependence had been placed in the Government under which they had a claim to protection, and which the common prudence of individuals would have overcome, if it had been individually applied.

Upon this subject, as well as upon many others, the French nation offers us an excellent example. At the present moment an estimate of the production of the kingdom, as respects wheat, has been obtained, and its anticipated requirements ascertained and provided for. This has been followed up by measures to mitigate its effects; and with a certainty of high prices following, a grant of a large sum has been made already, to take up the surplus labour, and for stimulating employment among the working classes, by making a large expenditure in aid of the public works of the country.

In England it is far otherwise. The merchants alone are watchful of coming events, and dispose their trading accordingly: in years of scarcity by anticipating the wants of the people by extensive purchases of grain, and in years of plenty by filling the already overcharged markets by importations, and unintentionally bringing down prices to such an extent as ultimately to become ruinous to both home producers and importers.

Every year brings its accustomed harvest, and the fact of the seasons having such an extensive influence upon its result, renders it impossible for human foresight to guard against all contingencies. With a full crop, sufficient will barely be found to feed the people: with a deficient one, ten millions of its money must be transferred to foreign ports, to replace it. The effect of such a drain during years of peace and of low prices of provisions has been frequently felt throughout the breadth of the land, and has more or less influenced the productive classes to an extent that could hardly be supposed, had we not experienced opportunities of witnessing them, and being thereby enabled on subsequent occasions to calculate their effects whenever a recurrence of them again occurs.

He is said to act wisely, who contrives to live within his income; but how could this individually be effected under the fluctuating prices of provisions, unless by adapting the means to the end? And who can say but that which applies to an individual does not apply to a community or a nation collectively? For, assuming that we grow twenty millions of wheat annually upon an average, an increase or decrease of ten per cent. would be sensibly felt, and the profits of the producer would be merged, unless prices should rise proportionately with the decrease. So on the other hand the consumer would be hardly dealt with, unless they had fallen upon the increase having been ascertained; and therefore, a well-established system of statistics would anticipate this result, and render that certain in the outset, which otherwise must now await the termination for a decision.

At the present moment considerable uncertainty exists as to the general result of the harvest. In some districts the crop is even abundant—in others very deficient—upon the whole nearly an average one is expected to be realized; but no one can at present tell what may be the result, nor will any one be able until the season is closing—until the amount remaining on hand can be estimated, and the final result be obtained, not from what has been produced, but by what has been imported. Many are the projects that have been propounded to meet this requirement; every one thinks his own mode the best, and all appear hemmed in with difficulties that may never arise. The chief one, however, is that farmers will resist it, or render it abortive by mis-statements, and, therefore, it is proposed by one of our contemporaries, who imagines all wisdom proceeds "frae the north," that the matter should be taken out of their hands, and that appointed estimators should yearly take the yield, and make the reports. Others less sanguine propose the boards of guardians as the medium of arriving at the result; but then comes in a suspicion

of the farmer who may happen to act in the double capacity of guardian and estimator, and the whole scheme become swamped by his mis-statement of his produce. As to any difficulty beyond that which arises in any case where details are to be collected to produce a result, we confess we see none appertaining in this particular instance. The machinery is at hand, and only requires adapting to the emergency. The kingdom is divided into counties, sub-divided into parishes, and still further into farms and occupations; the assessed taxes are annually charged and collected at a small expense; every parish has its assessor and collector, and twice in the year the taxes are charged, collected, and paid over to Government; and all this is effected with barely an effort.

Let every parish elect an assessor and collector for the corn statistical returns: let them proceed in the same way as in the case of the taxes, by delivering forms to be filled up by each occupier, as to the number of acres under each description of crop; and again immediately after harvest let a second return be made as to the estimated yield, and the business is completed, so far as obtaining the returns. All the rest is merely a mechanical operation. The returns of each parish may be entered under their respective heads, and signed by the collector and other parish officers, to be returned to the clerk of each union, and so step by step for each county, and finally for the kingdom at large. Persons refusing to make a return, or wilfully making a false one, should be punished in the same manner as in case of committing the same offence as regards their returns on matters of taxation.

We trust that our readers will appreciate our desire of showing how this desirable object may be effected with the least trouble, expense, or annoyance, and at the same time with certainty and success.

LOOK FORWARD.

If the experiments now being made in winter fallowing induce the farmers of England, by their success, to incorporate the system with their code of agriculture, we may all regard the introduction to our fields of the steam engine as inevitable. The method of paring the autumn stubbles, now so rapidly gaining the attention and receiving the cordial attestation of thousands of practical men, already claims more horse-power than it is found well to provide. But the introduction of winter fallowing will of necessity compel us to call in a power without which we cannot carry out schemes considered essential to remunerative cultivation.

The course gradually pursued upon all farms for economising farm labour, by substituting, for those hands that have gone to clear the cumbered ground of our colonies, the untiring, uncomplaining, stomachless machines that so materially lessen the cost of production, arrives by an easy and intelligible development at the employment of the steam-horse for the cultivation of our fields. We have already bid him beat out, and winnow, and grind our corn, and underdrain our land. He performs thus much with the air of one who has but put a finger to the work. We need not hesitate to place the yoke upon his great neck; for, depend upon it, he will plough, and subsoil, and pare, and scarify, &c., as well as he can thrash and drain. It is well to familiarise our minds with this thought, and prepare ourselves for the innovation. A revolution overwhelms, crushes, desolates a people that has not had the foresight to anticipate it, nor studied to make its wild vehemence subserve their interests. In the same manner, by anticipating the introduction of steam to perform our field work, and accommodating our ideas to it, we facilitate its arrival, and prevent that feeling of suspicion and contempt that almost always greets an innovation, and so frequently damages and retards its effectiveness. If we admit and recognise only those things we can conceive or understand, we very strongly resemble the learned men of a former age, who condemned to death the immortal Galileo, because he insisted upon the earth's being round, in opposition to the opinion of the world, which asserted it to be one immense plain.

The employment of the steam engine for tilling by traction is given up by all who have seen the futile attempts of Usher's machine, and Boydell's formidable monster. So heavy a mass of machinery as Usher's could never answer, save to knock itself to pieces. And Boydell's must needs fail of answering the purposes of the farmer, when half the power put forth is required to propel the engine. Besides, the strain, and wear and tear, and the expense appear out of all proportion to the value of the work effected.

But the principle that received its illustration at Carlisle, and which was seen but by few—the principle, it is meant, of actuating a travelling implement by a stationary engine, took us by surprise, and removed all doubt as to the manner in which steam will eventually *be applied* to the work of cultivation. The implement with ploughs, or grubber

or any other form of tiller attached, is not drawn backwards and forwards by engines stationed upon the headlands, but is driven by an engine at one corner of a field, by means of an endless rope moving at a high velocity. The driving rope, the thickness of a common plough line, runs at the rate of 22 miles per hour round a large wheel on the travelling implement, and exerts a powerful leverage that may be represented by the figures 11 to 1. Thus, while the driving rope is running 22 miles per hour, the tilling machine is going only 2, and the strain upon the rope is only one-eleventh of the whole draught of the implement.

The per-centage of power lost in the travelling tackle is very insignificant. The weight of the plough carriage that worked at Carlisle was 15 cwt. It was set in motion by 400 yards of rope. There were two ploughs attached, and something less than four-horse power exerted. The cost per acre may be calculated at 4s. to 5s.—turn-wrest work. Ploughing and harrowing can be effected at the same time; and, of course, the number of ploughs to be attached is optional.

The question that has engaged many minds lately, namely, how far the form of the plough is the best suited for the inversion of all qualities of soil, is of course aroused.

It should be generally borne in mind, that the introduction of a new power to accomplish an old purpose always involves a change in the method of proceeding. The two main changes of the present day, travelling by steam, and conversing by electricity, at once illustrate this assertion: there is not a *form* left of the appliances they have superseded. Such a radical change, however, seems to be anticipated but by few. The very mechanist appears to consider that steam power must follow in the wake of the plough. From the dry soil of the South the plough was introduced to the heavy and retentive soils of the North, and expected to work the results in Great Britain that it wrought under the perpetual summer of Egypt and Italy. This curious and very illogical prejudice has held us in bondage a long time; and even now that we are beginning to think of the application of steam, it still haunts us; for we seem scarcely able to conceive of aught save a steam plough. Unyoke the horse, and shackle the engine to the plough, six ploughs abreast, any number of ploughs abreast, so that we keep the *plough!*

Mr. Heathcote, Lord Willoughby, the Marquis of Tweeddale have each thus erred in rendering too literally the old motto, "Speed the plough." Great credit is due to these gentlemen, and others who have followed them with invention after invention, the specifications of which assume quite a formidable appearance upon the shelves of the Patent Office. The mechanist has not yet been thoroughly impressed by the fact that we care not so much for ploughing as for cultivation. What, for instance, is required for the successful growth of green crops? Why, to have a soil free from weeds, thoroughly comminuted to the depth of six or eight inches, and yet moist enough to ensure the ready vegetation of the seeds deposited. But for this purpose the plough is the worst thing that can be brought into the field. The iron shod weight that draws it is far from desirable upon land at all liable to injury from the tread of animals; while on account of its own construction it is liable to great objection. Does it not solidify, by its wedge-like action, the soil it partially inverts? and by rendering it an impenetrable barrier to the sponge-like roots that descend to find nourishment for the stem, does it not do incalculable mischief to the subsoil? In fact it does all its work at the expense of the subsoil, which, instead of being pervious, is as impervious as possible.

It is necessary that the soil shall be completely inverted. The plough only partially answers this requirement, and does so, as has been stated, at the sacrifice of those qualities of surface and subsoil so valuable to the farmer.

We require that the soil shall be *cultivated.* But the plough does not cultivate. It must be followed by the harrow, the roll, the scarifier, &c.; and ere the process of comminuting is completed, its efficiency is reduced most materially by the injurious pressure of horse's feet and heavy implements.

Those who have given the best attention to this subject, all concur in this view—that, as in other cases where steam has been called to our aid, it adapts the materials found to its own method of working; so, when we desire it to cultivate our fields, we must not expect that it will gear on to those means and appliances that are thus antiquated.

"Labor omnia vincit."

F. R. S.

ANNUAL SALE OF NEWSPAPERS.—At the Leeds Commercial News-rooms, yesterday, the annual sale of newspapers took place, and the prices they fetched will in some degree show the estimation in which certain journals are held by the public. The London *Times* sold for 2½d. and 2¼d. each, to be delivered the day after publication; *Daily News,* 1½d.; *Herald,* 2d. and 1d.; *Post,* 1½d. and 1¼d. Of the London weekly papers, the *Mark-Lane Express* realized the highest figure, being 4¾d. The *Leeds Mercury* sold for 4¾d. and 4½d. per week; *Intelligencer,* 3d. and 2½d. per week; *Leeds Times,* 2¼d. and 2d.; *Bradford Observer,* 1d.; the *Manchester Guardian* realized only 2¾d. for a week's issue (six papers).—*Leeds Mercury.*

MR. RUEGG'S ESSAY ON AGRICULTURAL GEOLOGY.

Each successive volume of the Journal of the Royal Agricultural Society bears its testimony to the truth of those doctrines respecting agricultural geology which have been so often enforced in these columns. Those doctrines are, that while the general agricultural characters of a district depend on the outcrop of the solid strata of which it is composed, there are on each of those strata, even when its mineral composition is uniform through its whole course, soils of very different qualities and values, and that these depend upon the depth and composition of those superficial deposits which overspread the solid strata, and are more or less independent in their composition of that of the rock on which they rest. The Prize-report by Mr. Ruegg, in the January number of the Journal of the Royal Agricultural Society, forms no exception to this rule. The memoir is accompanied by a geological map, reduced from the Government survey, for which the author acknowledges his obligations to Mr. H. W. Bristow, by whom the county was recently surveyed; and he dwells with some degree of satisfaction on the fact that among the numerous and varied strata which the county contains, from the lower Bagshots to the lias inclusive, the typical names of three of them, in whatever district they may be found, are derived from this county, viz., the Kimmeridge clay, the Portland oolite, and the Purbeck limestone. "The strata of Dorsetshire are not only numerous and varied, but from the Bagshot sands to the lias there is not a member of the eocene, the cretaceous, the oolitic, or the lias series, deficient." He dwells also, with no little complacency, on the abundance of materials of general usefulness which these strata supply: the building stone of Portland—the marble of Purbeck—the various building stones of the coral rag, and the green sand—the clays of Wareham and Corfe Castle, the finer produce of which supplies the potteries of Staffordshire, Scotland, and even Spain and Holland, while the inferior produce is largely applied to the manufacture of alum, rough delph-ware, and drain pipes. Then there is the Smedmore shale of the Kimmeridge clay, which furnishes naphtha and carbon; while the refuse has been tried with some effect, though not extensively, to the neighbouring turnip crops. The lias furnishes a good hydraulic cement; the chalk affords the best of lime for building purposes, as well as a useful manure; and hopes are expressed that to these may ere long be added a supply of the soluble silicates to which attention has already been directed by Professor Way.

A county so rich in a variety of strata must be rich in organic remains. Some of the most remarkable are enumerated by Mr. Ruegg. For the identification of strata under doubtful circumstances, fossil remains have a practical value. As indicating the changes in organic life which have taken place upon the earth, they belong to speculative geology; and however interesting they may be in this point of view, geology in its application to agriculture has little concern with them. Mr. Ruegg appears to be of this opinion himself; for, after dwelling with some complacency on the richness of Dorsetshire in organic remains, as "the geologist's chief glory," he observes that however interesting the county of Dorset may be in this respect, we have to regard it in a purely utilitarian point of view, and to look upon its various strata as containing not simply the fossils of bygone ages, but chiefly as containing the elements which may produce subsistence for the present and future generations. Referring to Mr. Bristow's geological map of the county, and the minute accuracy with which it expresses the varied geological features of the district, he compares it with the map prefixed to Stevenson's Report of the county in 1815, or even with that of Dr. Buckland's famous Bridgwater Treatise, and adverts to the much greater attention to details with which the Government geological maps are executed. This is all perfectly true. We have often spoken of those maps as the best ever executed. But let us compare like things with like; and whilst affording its due meed of praise to a work executed at the public expense, let us do justice to those labourers who in the sweat of their brows, and with their own unaided resources, hewed the first track through the thick and tangled forest—that track of which we are also glad to make use when engaged in the work of correcting its details.

The writer then continues: "And yet even the present careful survey leaves our *geocultural* requirements still unsatisfied: it is with the rock only that the geologist cares to deal. It is with the soil upon that rock that the agriculturist has the chief concern. But the rocks and the soil above them have often opposite characters, and the geology of the former is useful only in what may be termed the *geoculture* of the latter. The depth of that soil, when composed of drift or erratic tertiaries, often exceeds the greatest extent

to which, for the purposes of agriculture, we penetrate." The following passage is then quoted from the "Prize Essay on the Agricultural Geology of England and Wales":—"When they are only two feet thick, they constitute in many cases both soil and subsoil. When the depth extends to seven feet, it is greater than that of the deepest drains of the deepest drainers. There are many places in which these deposits are several hundreds of feet thick, and there the substrata can have no agricultural value whatever, except from the fossil manures which are furnished by their exposure within accessible distances. In our geological maps all these deposits are assumed as removed, and that rock is represented as constituting the surface which would in such case be the surface." Here, then, the labours of the geologist cease, and the chemist must take up his work, and, by analysis of the soils lying on those rocks which it was the province of the geologist to name and explain, must show to the tiller of the soil its constituents and its properties. To this stage, it is agreed by all agricultural writers, no county has yet reached. We should rather say that here the labours of the agricultural geologist should commence to lay down the areas occupied by soils of similar quality, aided by the chemist, as in the investigation of the solid strata he had been aided by the palæontologist and the fossil remains, by which strata of the same position in the series are identified under different mineral characters by means of the organic remains which characterise different epochs in the world's history—that is, different portions of the series of successive surfaces.

With regard to the agricultural divisions of the county of Dorset, Mr. Ruegg states that it has been happily divided into the three divisions, styled respectively the *Felix*, *Petræa*, and *Deserta*; the first including its fruitful vales, the second the oolites and other rocks, and the last its barren and forsaken heaths. If he continues under the second term the chalk formation, we have as clear a general description of the county as we can well obtain; and, with a few slight reservations, these three terms are convertible into the three great classes of soils—the clays, the chalks, and the sands. After noticing some exceptions to the term "happy," in the soils of the districts so named, we are told, in reference to the chalk, that its soils vary so greatly that as many as nearly a dozen different qualities are discernible in the same field, and a newly-ploughed hill-side will exhibit every tint from chocolate-colour to white. In another passage Mr. Ruegg observes: "In the map of the soils appended to Stevenson's Report, the surface is conveniently divided into chalk, strong chalk, sand, clay, &c. Now that we see it striped and ringed, like a taw marble, with its belts of coral rag, green sand, Kimmeridge clay, &c., we shall naturally be anxious to discover how far the surface-soils correspond with the rocks on which they rest. Such an examination, even of one county, would be the labour of a life. We can only attempt to indicate a few features of difference. The tops of the chalk-hills are covered in many places with an accumulation of flint-gravel, the remains of the denuded chalk, sometimes, as on the downs west of Buckland-Newton, to the depth of twenty feet. This is also the case in the valley, the sides of the hills being bare, or nearly so. In some stiff clays, galls occur in the centre of a chalk-field, requiring the aid of the drainer, whilst the soil around is drained by nature. In the Vale of Blackmoor, the clay in many places is bare of drift, as at Bagber; but in other places there is a deep deposit. At Marchfarm, west of Buckhorn-Weston, the drift is derived from the coral rag; whilst in the river-flat west of Hodhill there are pits of flint-gravel. The diluvial gravel on the banks of the Yeo is derived from the inferior oolite. The mineral characters of the rocks themselves change, as well as those of the drifts. The limestone of the coral rag, which is so well developed at Marnhull and Todber, and the Stowers, dies out towards the south, and is replaced by marls and clays, and occasionally rubbly limestone. In the Heath district the soil is of the most variable character; and here and there, amidst much that is barren, little cultivated plots, like oases in a desert, indicate that varying condition of soils of a common order which is to be observed in this as in every other county in the kingdom."

Here, then, is another refutation of the old doctrine in agricultural geology, that, the nature of the soil being given on one part of any geological formation, we know it for the whole area which that formation occupies.

ON THE CAPABILITY OF IMPROVING THE NEW FOREST DISTRICT.

If a continental farmer was landed on the bank of the Southampton Water, and thence travelled to the westward as far as Dorchester, he would conclude, after passing over some sixty miles of miserable gravelly soils, tenanted very commonly with heath, and patches of equally worthless Scotch firs, that England was indeed a poor and deplorably-cultivated country. If such a traveller had landed, towards the end of the last century, at Wells, in Norfolk, and traversed an equal extent of the wild sandy heaths, since formed by the genius and the energy of the late Lord Leicester into fertile land divided into prosperous farms, he would have arrived at the very same conclusion. Why, then, let us inquire, has the fate of these wild heaths been so dissimilar? How have the heaths of Norfolk been fertilised, and those of the New Forest and East Dorset allowed to remain barren? The answer is not difficult; for the cause is palpable enough. The light sands of Norfolk were rendered more solid and fertile by the applications of heavy dressings of marl or clay, or clay and chalk, afterwards aided, it is true, by the folding of sheep; but in the New Forest district, little or nothing of the kind has yet been attempted. When we traversed this large and picturesque district, only a few days since, we could not but feel how little indeed appeared to be doing in this way. It is very true that the soil is naturally a hungry gravel, often saturated with water; but the difficulties of the case render more necessary the adoption of decisive efforts—half measures will never repay the owners of the tens of thousands of acres over which we passed between Southampton and Poole, and Poole and Dorchester. The water, of course, must be first removed, and then a new soil must be as it were formed. You have here to contend with a land covered with a silicious irony gravel. You must add to these worthless soils carbonate of lime, alumina, phosphate of lime, and the salts of potash and ammonia, before they can be productive of remunerative crops. You must have not only the soils analyzed, but also the earthy dressings you propose to spread over them. To employ for such a purpose such clays as we have observed some farmers in this district carting on to their black gravelly fields is a waste of energy on a worthless material. Such landholders evidently were unaware that it is not additional *tenacity* which these soils require; they chiefly need more clay united with calcareous matter, or marl, more friability, less water, and a freer circulation of air through them. It would be well if these active little farmers were fully assured that the dressings which the Norfolk agriculturists employ so successfully are not chalk or clay, but a mixture of both, or marl, and that commonly the most valuable varieties of marl are those in which the chalk exists in the largest proportions. To a very considerable extent our observations support the views of Mr. Joshua Trimmer, in the last half volume of the "Journal of the Royal Agricultural Society," in a paper which we heartily commend to our readers who tenant that large district. After noticing the extent of mineral manures which are here to be found, he dwells upon the use of the soft chalk of Bere and Wool. These, as might have been anticipated, have been used with great advantage on the soils resting on the London and plastic clays, and on the red land or loams, at the rate of twenty or thirty tons per acre; but on the hungry gravels, or Bagshot series, it is alleged that without it is applied in quantities of not more than six tons per acre, it does harm; for, although the farmers admit that when used in larger proportions it prevents the anbury in turnips, yet it at the same time makes the corn turn yellow, and prevents it coming into ear. Here, too, the experience of the skilful Norfolk farmers may well aid those of the New Forest district, where, as Mr. Trimmer remarks, the same difference of practice exists in the application of those kinds of dressings as in the days when Arthur Young described the Norfolk husbandry—some farmers using 100 loads to the acre; others not more than 20. An opinion, however, appears to be gaining ground in favour of light dressings frequently repeated, in preference to heavy manurings at long intervals. Those who favour the former method make an exception in respect to moory sands, which when first reclaimed require heavy dressings, and that with a mixture of clay and chalk, in which the chalk prevails. These are the kind of soils which in Dorsetshire are considered to require the lightest dressings of *chalk*. Similar observations have been made by some of the Norfolk farmers after *chalking* their light loams; but heavy claying with the chalky varieties of boulder clay, containing much chalk, have still their advocates, especially amongst the older farmers, subject to the provision that they must be accompanied by liberal dressings of organic manure. "If you clay heavily," they say, "you must muck heavily, or you will set the land."

In thus dwelling upon the improvement of the New Forest district, the distant reader must not suppose we are speaking of a small extent of land, since we are within the mark when we say that this poor, ill-cultivated country covers, with an occasional oasis of better land, three or four hundred square miles. Of this it is true that the Crown holds a considerable proportion of badly-planted and miserably managed forest, and this is encumbered with rights of common which ought long since to have been abolished; but, after making all these allowances, there is, we feel, ample room for improvement, not only on the part of the Crown, but by the holders of private estates, to an extent which renders the result of the necessary effort nationally most interesting.

THE CULTIVATION OF SEA SAND, OR SAND HILLS.

BY DR. PATERSON, OF GLASGOW.

In Britain there are many hundred thousands of acres of sea sand, driven into heaps by the wind, and absolutely useless. Being on the level of the sea, such deserts enjoy the best of climate, but continue hopelessly barren, on account of the hitherto unconquerable difficulties of dealing with the subject. The shifting nature of the mass, from the action of winds—very like the driving of snow—renders every effort abortive, and soon obliterates what the hand of industry had wrought. Should these difficulties, however, at a moderate cost, be overcome, the encouragement is immense—say a million of acres turned into clover and waving corn, instead of waves of desert sand. The writer has seen a small sheltered corner reclaimed which yielded ten pounds per acre of annual rent; and the soil was originally no better, and in fact no other, than that of the common sand-hills. The method proposed is first to have a command of water raised from the sea, or from the nearest river or brook, and ready for distribution, after the manner already in use for the application of liquid manure to a farm. In the latter case, the cost of the apparatus is profitably incurred, when the object is only the applying of manure; in the former the application would be, in the first instance, to the creation of the soil; whilst it would still remain for the purpose of manuring as occasion might require. Having thus a command of sea or river water, all the obstacles to an easy and cheap cultivation are immediately overcome. Let navvies be employed to level the breadth of a ridge or two running in the direction of the most prevailing wind; and let their work be instantly followed by a copious irrigation. On the warm wet sand, which the winds in that state will not stir, spread plenty of guano, or bone dust, and sow clover, with a few grains of barley and perennial ryegrass, and in a few days there will be a beautiful verdure, leaving to the owner the choice of sheep-grazing or cutting with the scythe. Speaking of a ridge-breadth formed like a road, it is only meant that such is a beginning; and that the levelling and sowing keep pace; and evident it is that neither extent nor exposure on such a plan can prove any hindrance; though it may be expedient on account of the freaks of the wind, to leave it, for a little time, a narrow space to play upon, between the unlevelled brow of the desert and the new-sown ridge, taking care that that narrow space itself be duly watered. Where irrigation from the sea is found most convenient, there will be also the advantage of a saline manure; and it is observed that sheep are always exceedingly fond of grass that has been showered by marine spray, or washed by the tide. It is needless to speak of enclosures which will be proper where the waste regions are large, as, doubtless, thorns will grow, especially the sea-thorn, where grass and corn can be made to thrive. And it need not be observed that the planting of hedges should be at the first, when they would get their share both of the guano and irrigation. After the hedges are well grown, the surface consolidated, and the soil has acquired some admixture of vegetable mould, the plough may be thought of, but till then it will be as wise to let well alone. For aught that the writer can see, there is no reason to fear the perfect and economical success of the methods now suggested; and it is earnestly to be hoped that some noble and spirited proprietor, such as the Earl of Eglinton, who is not a little interested, will try the experiment. But all the more certainly will such experiments be made, if the scheme now proposed meet the approbation of the more enlightened and influential of the agricultural body. Then, in all probability, it will not be long till many dreary and desolate tracts of our country, which have long appealed in vain to the science and industry of man, shall assume a very different aspect; when the unsightliest objects in nature will take on the form of beauty; and sand as barren as the winter's snow will yield food to the honey-bee and wealth to the husbandman. And thus by their countenance may be afforded the means of causing, in the literal sense, "the desert to rejoice, and blossom like the rose."

STEAM CULTURE—THE MERITS OF PRESENT INVENTIONS.

The press should not be behindhand in urging forward the great question of steam culture. Embryo schemes exist in many parts of the kingdom: one man has a digging machine; another, a ploughing apparatus; a third, a new motive power light enough to do all that is required on arable land. The success of any one or the whole of these inventions depends in a great measure, if not entirely, *upon the kind of reception they meet from the public;* and therefore, as far as it lies in our power, we will endeavour to prepare the agricultural world for a revolution in tillage-husbandry, and familiarize the farmer with ideas of what may be termed "power-ploughs" and "steam-spades."

Fowler's draining plough may be considered as the forerunner of steam cultivation; and, indeed, its history well illustrates the advantage of a pre-education of the public mind in the introduction of novel agricultural machinery. It is well known that Mr. Fowler devoted years of patient ingenuity to the construction of his mole-plough, and that he had to struggle with innumerable disappointments and mechanical difficulties before he finally perfected all the beautiful arrangements and contrivances involved in the invention. But all the fretting and anxiety, and several thousands of pounds expended in bringing the invention to maturity, he felt as nothing to the weight and resistance of prejudice, unbelief, and apathy which he had afterwards to overcome. Men's minds were unprepared for such a striking innovation; but indomitable perseverance and inexhaustible resources of mechanical combination have ultimately subdued those obstacles. Not only does the machine execute drains five feet in depth in clay land, and three or four feet deep in gravelly and harder ground, and with an accuracy of manipulation and a regularity of level unequalled by the most perfect hand labour, but it has already performed its work with economy over many thousands of acres in all parts of the kingdom. Taking the average distance of drains to be 3½ to 4 feet, and the tiles and cartage at average cost, the patentee contracts for the execution of drainage at from 70s. to 80s. per acre—finding tiles, cutting main drains, and including surveying and all other expenses. There are three of these steam draining ploughs and fourteen actuated by horse power now in operation; and with the horse machines tiles may be laid 3 feet deep and 24 feet apart on land with a slight fall, with perfect accuracy, at a total cost of about 15s. per acre. Even now, however, there remain some localities in which Mr. Fowler has great difficulty in persuading a single owner or occupier to allow him to drain a piece of land *gratis*, just to exemplify the capabilities of the machine.

Now, had any previous inventor practically succeeded in making a stationary motive power perform operations about various parts of the surface of a field, Mr. Fowler would not have encountered so much opposition, or rather so much of that more impregnable resistance—passive indifference and neglect. And because he has really achieved success in applying stationary motive power to one kind of field work, the agricultural public will not be so incredulous when another mechanician shall proclaim that he has produced a method by which a steam engine performs another kind of field-work. When once a *power*-loom had been constructed, it became comparatively easy to adapt the principle to different sorts of weaving. And the more intelligent and speculative farmers among us, having seen the *draining* engine, are now not only prepared, but expecting to see a *cultivating* engine.

Let inventors, then, take courage: when the mechanical difficulties are beaten, there will not remain any invincible hostility or immovable dulness among the agriculturists to be awakened and battled with. Thanks mainly to the exertions of Mr. Fowler, and in a less degree to the labours of other practical men, a steam engine in the fields is no longer a startling novelty, no longer a creation of theory; it has become a tangible reality: and if the agricultural press will but fulfil its part in developing the principles and spreading information upon the practical points connected with steam tillage, any machine once proved to be efficient and economical will be sure to meet with a welcome.

We would always avoid making a rash decision upon the merits of a new scheme; but remember, at the same time, that while hesitating to receive any invention as sufficient for our purpose, we are liable to find ourselves in the ludicrous position of one hunting for his spectacles when bystanders are observing them prominently displayed upon his person—in other words, we may be searching in vain for a mechanical idea which may already exist close at hand, but overlooked in our superficial scrutiny. It is just possible that English agriculturists may be now awaiting the advent of some inventor with

a new steam cultivator, while the wished-for machinist and the right invention are already here.

We therefore entreat our readers, interested in the enquiry, to re-examine the capabilities and merits of existing inventions, and to consider whether a thorough testing and improving of some one of these would not suffice, instead of a perfectly new invention which may be yet a long time in arriving.

AGRICULTURE THE PROPER CALLING.

The following communication contains some hints which may lead our readers to reasoning on the subject more correctly—to look with a more kindly eye on what may have hitherto been, to some, necessary rather than pleasant duties.—Eds.

When we view the various connections and relations by which men are united, as constituting one vast whole, and as existing here upon a world from which they derive their support, and the harmony which external nature bears to their own, we can but arrive at the conclusion that the proper calling of mankind is Agriculture.

All other pursuits are proper in their places, but, when carried to too great an extent, produce poverty, distress, and misery. The more agriculture is pursued, the greater is the benefit to the human race. Here is a field for the philanthropist. Establish agriculture upon a good basis—the basis of intelligence—and you will do much to close what are now flood-gates of misery to society. Our city poor, our merchant clerks, our emigrant-poor, and our country poor, all call for relief; and here alone can it be obtained—in intelligent husbandry. Agriculture is the great moving power of human existence, and as the human family increases we must but cling the closer to our mother earth for support. Thus the mandate, "to earn our bread by the sweat of our brow," becomes from our condition a matter of necessity; but in it we see the goodness and wisdom of our great Law-giver, for "necessity is the mother of contrivance:" we thus increase in intelligence, and intelligence promotes morality and happiness. In the dim but yet brightening future, we behold, instead of cities over-crowded with human life and ragged pauperism stalking abroad, the whole face of nature one great Eden,—the sons of Adam all inheriting his estate. Agriculture exerts an influence to equalize the distribution of wealth, which no law, nor theory, nor any other pursuit has or ever can accomplish.

It may be said a life of labour and retirement does not promote intelligence, and hence the farmer must obtain his knowledge from a higher class, and thus ever occupy a secondary position in society. Servile drudgery and intelligence are seldom found as companions, but the farmer has those advantages for obtaining and *using* knowledge which no other occupation can possess. Men whose lives are devoted to study may be famed for scientific investigations; merchants and commercial men for extensive information of the manners and customs of different nations; but it is the peculiar province of the agriculturist to possess sound reasoning powers and correct judgment. His very calling makes it necessary that he should constantly draw upon the resources of his own mind. We speak now of the present condition of the agricultural class. We hope to see an improvement—a brighter day, when the light of truth shall dispel the darkness and reveal treasures of knowledge now hidden from our view.

The American farmer is far behind in intellectual culture, which his occupation does not hinder him in the least from attaining. The facility with which knowledge may be obtained by means of books and other sources, render him entirely inexcusable for ignorance, especially in the laws of nature. With these his very station demands of him a more intimate acquaintance. The scope of his observation being so great, and his daily intercourse being with the very elements of nature, and yet to be ignorant of her laws, and the knowledge of them which other men have obtained, should bring the blush to his cheek. The study of nature and of her laws brings man to the knowledge and more intimate acquaintance of his Creator. Therefore the more enlightened agriculturists become, there is a direct tendency to promote morality, and we establish a class of men the most influential in society, the only aristocracy. The occupation of the farmer, then, does not hinder him from standing among the best classes of society. As he wipes the sweat from his brow, and looks up to God to bless the work of his hands, and provide him with his daily bread, to give him copious rains, genial suns, and fruitful seasons, his heart is filled with that hope and confidence which no other occupation can produce.

We have only considered agriculture in an intellectual and moral point of view. As a source of wealth, there is none so sure; a competency is open for all. Why, then, will the young and enterprising leave it for other precarious callings, now filled to overflowing?—"The Country Gentleman" (American Paper).

CORN SUPPLIES FROM ASIA MINOR.

By securing for the inhabitants of Asia Minor or Anatolia a greater degree of civil and religious freedom, can we procure from its once-fertile and populous provinces a greater supply of corn? From the Asiatic shores of the Black Sea we have of late been receiving increasing supplies, during which time progress has been making in civilization. Can we by further progress increase the supply, so as to render us independent of the opposite or European shores of that sea? The area of the peninsula is about equal to that of Spain, and, from being situated between the same parallels, the climate and products of the two have often been compared to each other. They are also nearly on a par as to the progress of the arts and sciences, while population and political circumstances are rather in favour of than against the former. Can we, therefore, procure from it an equal quantity of bread corn through the instrumentality of similar means, during the impending circumstances of the war with Russia, it will heighten the interest that all must feel in its future destiny.

That machinery, irrigation, and improved husbandry in general, with the opening up of the peninsula by railroads, would bring to its exporting towns more than tenfold its present produce of wheat, is a proposition which may be safely enunciated. Its high mountains, plateaus or table lands, and lakes furnish an ample supply of water for irrigation, requiring no great amount of engineering to apply it; and wherever applied, the produce, under the most slovenly management, is superabundant. This is the testimony of every traveller who has been an eye-witness to the facts of the case. In works of agricultural improvement, Moslems have not only done nothing, but overthrown the industry of the Greek and Roman periods, turning the whole country into its natural state to suit their own pastoral habits. The laborious pursuits of agriculture they even condemn as beneath the dignity of Islamism, living almost entirely on the produce of their flocks and herds; and they not only have followed this course themselves, but by placing the Christian population under the most abject slavery, have compelled them, as far as possible, to comply with it also. Under such circumstances, all the national aqueducts and works of irrigation have not only been neglected, but many of them broken down, in order to water grass lands and enforce the pastoral system. No wonder, therefore, although lately Islamism has been on the wane, whilst Christianity has been on the increase. At present the whole population, estimated at nearly 11,000,000, probably equally divided as to creed, one-half belonging to each, certainly never in any previous period of their joint history manifested the same degree of willingness to embrace industrial enterprise: consequently, there is good reason to conclude that, were the proper mechanical means placed within their reach, and the necessary security given of enjoying the full benefit of their labour and capital, the result would be an abundant supply of corn, and demand for manufactured goods.

The practical question, it will thus be seen, is to procure for the inhabitants the full enjoyment of such means. Doubtless the work is one of time, surrounded with many difficulties, the greatest of which are those arising out of the present war, taken in connection with the ignorance and divided character of the people as to religion.

With regard to the intelligence of the people, it may be safely said that to elevate them to the English standard would at once place the Rayas, or the Christian population, beyond the dangerous influence of Russian aggression; at the same time it would also enable the Turks Osmanlis to see the absurdities of the Greek Church relative to the holy sepulchres, and that universal sway in Ecclesiastical affairs which she so blindly grasps, for political purposes, in a very different light from what they now do; while it would establish, in the minds of both, unity of purpose for their national welfare—circumstances which neither enjoy at present.

The schoolmaster abroad in Turkey, therefore, or the introduction of a more perfect system of education, so as to instruct the people in the arts and sciences, is the first practical step towards a permanent settlement of the Eastern Question, and the establishment of industrial enterprise in the peninsula of Anatolia. In effecting this, less opposition will be experienced, we presume, than in Spain; so that the sooner the work is begun, the better for the general welfare of the Ottoman Empire, in every sense of the word, and also the peace of Europe.

In a country naturally so fertile, but thinly inhabited, and holding out so many invitations to Russian aggression, something more than mere intelligence and unity of purpose on the part of the inhabitants will be required to protect its corn trade, or other branches of industry which may arise on the Asiatic shores of the Black Sea. With her Mediterranean fleets, England can always protect the southern shores of the peninsula from harm; but, if excluded by treaty from the Euxine, unless ample provision is made, nothing short of the breaking up of the Russian Empire will prevent Russia from pouncing upon the Bosphorus in some unfortunate hour, taking the exclusive possession of the northern provinces of Asia Minor, and robbing them to support her armies, as she did Moldavia and Wallachia last year. She would not only thus benefit by the improvements made, but obtain from this source ample supplies for her countless hordes on their march to the "Holy Land," where she proposes establishing at Jerusalem the universal government, not only of Christendom, but of the whole world. On the contrary, were the southern shores of the Black Sea more strongly fortified from Varna to Trebisonde, and the fortifications of the Bosphorus rendered impreg-

nable, Russia would then be obliged to march on Palestine *viâ* Georgia, and to draw her supplies from Egypt, should she ever establish herself in Judea; while it would protect the improvements of Anatolia and its corn trade, with the whole of European Turkey. Under such a catastrophe, the industrial machinery of Turkey west of Syria would be preserved.

In order to show the greater necessity of something of this kind being done, we have only to mention the fact that the Black Sea provinces of the peninsula are those from which we would most likely receive the greatest supply of corn, especially at the commencement, and where Russia would effect a permanent footing in the Ottoman Empire. On the opposite side, lofty mountains rise abruptly from the Mediterranean, causing extreme drought to be felt in Lycia and the adjoining provinces. Westward they recede farther from the shore, along the Greek Archipelago to Thyatira, where they again approach it. Here the climate is drier than on the north side, in some places scorching much of the land suffering for the want of water during summer, and consequently would require expensive works for irrigation. No doubt every encouragement is given for this; for in the large river valleys, where there is a sufficiency of moisture, the land is in the highest degree fertile, some of them — as on the Xanthus, Calbis, Mæander, and Hermus — being of considerable extent, capable of yielding large returns of corn, and, with the progress of science, will no doubt do so at no distant date. But in the outset, the magnitude and number of engineering difficulties are such as to require a little time to effect their removal, and progress must be retarded accordingly. On the contrary, much of the north has only to be broken up from a state of nature, and sown with wheat, to procure abundant crops. A very large area of it is covered with magnificent trees, which, under an improved system of agriculture, and of the arts and sciences generally, would form a source of great commercial wealth. One forest alone contains about 3,000,000 acres, and receives the significant name of "*Agatch Degnis*," or "Sea of Trees," from the Turks.

Doubtless, the Western Powers can procure some settlement for the peninsula of Asia Minor, and the work of extending it to European Turkey would not be surrounded with much greater difficulty. Into Syria, Palestine, Arabia, and Mesopotamia, it would be otherwise, from the character of the inhabitants and country. So long as the Danubian Principalities are occupied by Austria, some difficulty might be experienced in introducing mechanical progress there; but into Bulgaria, Bothnia, and Roumelia the work may be commenced immediately. There is nothing to prevent this; and the Turkish Government sacrifices its best interests, present and future, if it does not enlist the co-operation of the Western Powers in so promising an enterprise — one which would do far more than double the productive resources of the empire, and hence its financial condition, thus enabling it to fulfil the heavy pecuniary obligations it is now contracting. And even in Wallachia and Moldavia, no rational argument can be advanced why Austria should not be compelled to adopt a different line of policy, since she is determined not to draw the sword; for, so long as she preserves neutrality, she has no right to enjoy the privileges of war (if the spoliation of an injured people can be included as such). But, whatever is done on the further side of the Danube, or even the other provinces of European Turkey, obviously no time should be lost in commencing the work in Anatolia. The present exigencies of the Western Powers, especially England, no less than Turkey herself, demand this, thus rendering procrastination and delay inexcusable.

A very strong argument might be raised for even compelling Turkey to join in the march of progress we have just proposed; and this may be done, too, without in the slightest degree interfering with her imperial dignity, for the proposition only comprises the legitimate conditions of a pecuniary contract which she herself has been obliged to enter into with her allies—conditions which they are perfectly justified in demanding of her to ratify, in order to establish on a solid foundation the counter conditions or security which she offers. Turkey, for example, may propose—as we believe she has already done—to give Wallachia and Moldavia their independence on the same terms as she did to Servia and Egypt; consequently she may then propose to hand over the revenues of the two principalities in security of borrowed money. But, under existing circumstances, the Allies, more especially England, have a right to demand that the Principalities are bound to extend civil and religious freedom to their subjects, and otherwise to join in the march of progress as proposed, in order that they may be able to fulfil the financial obligations they come under, and defend themselves from Russian aggression within, or the influence of the Greek Church sympathising with the downfall of Turkey before they receive their independence, while Austria would have to extend a different policy towards English securities. That they (the Principalities) would agree to this, cannot be doubted; for they would have every inducement, present and future, to do so, being able to grow large supplies of corn, and adopt improved agricultural and other machinery with manifold advantages. A very cursory glance at their agricultural resources will show it.

This, however, on the part of Turkey, is not enough; for if she mortgages the revenues of her independent states, with what is she to defend the Bosphorus and northern shores of the Black Sea? To defend these in an effective manner will require a large and well-disciplined army; and how is she to support such unless the agricultural resources of the empire are properly developed? To protect such a length of seaboard, it is not only requisite to have a large Turkish army to defend Islamism (which, by the bye, can no longer be defended with the sword), but an army of her Christian subjects to defend their rights, with the general interest of the empire.

From these observations, imperfect as they are, it is manifest, therefore, that Turkey can no longer govern her empire on the "do nothing principle," and that, as the Western Powers have found it necessary at her own request to interfere on behalf of her Christian popula-

tion, they must also interfere on behalf of physical science, in order to procure the means of self-defence; for since they are now shedding their best blood at Sebastopol in fulfilling their agreement as allies, they have unquestionably a right to demand that she, on her part, adopt the necessary means to avoid a repetition of such a calamity. Thus much they have already purchased dearly.

NOTE.—Since the above was written, Turkey has contracted the contemplated loan; but, instead of giving France and England the revenues of the Principalities in security, part of those of Asia Minor has been given, which, consequently, doubles the force of our argument for agricultural progress. A firman has just been granted authorising the formation of railroads, and also, we believe, colonization, thus proving that the Ottoman Government is sensible of its own weakness, and willing to adopt the legitimate means for elevating Turkey to that position which she ought to occupy.

THE PRESENT POSITION OF THE ENGLISH FARMER,

AS SPOKEN TO AT OUR AGRICULTURAL MEETINGS.

There never was a time—at least, within his own recollection—when there was more necessity for forcing the productiveness of the soil to the fullest extent than there was at the present moment. A great moral obligation was therefore resting upon them, as men, as Englishmen, and as British farmers; and he really did believe the farmers were at the present time doing their utmost to increase the productiveness of the earth, and he believed that, in doing so, they were not only looking at it through the narrow view of their own pecuniary self-interest, but that they had at heart the great interest of the people of this country. A little time ago—a time that was in the lively remembrance of all present—the agricultural interest passed through a phase of considerable depression. There was a time when the agriculturists of this country were wont to be told (and in making this allusion he would be the last man to break the rule which excluded political topics from their meetings)—there was a period when the British farmer used to be twitted and met with the assertion that people did not care whether he produced corn or not, for they knew who would; but he would like to know if any man dared now to put aside the diligence and intelligence of the agricultural community. He said no man would do so. If they looked at France, what would they find? They would see that the all-absorbing subject in that country at the present time—one which almost rose above the general joy of the people at the capture of the Malakoff and the fate of Sebastopol—was with reference to the necessary supply of food during the coming winter, because, according to the official returns published in the *Moniteur*—which spoke not like a newspaper in England, but emanating from the great source of power in that country, must be regarded as a declaration of what was likely to occur, so far as human calculations could go, and from that statement, issued on the authority of the French Government—it appeared that there would this year be a deficiency in their production amounting to at least one-tenth of the wants of the population, and the question arose how was that deficiency to be supplied? This was a subject which created great anxiety in France; and they said, "We must stop all exports, and do our best to promote imports from every quarter." That was the state of things now in France, in a country from which we were a little time ago drawing a large portion of our supply. He was only too glad that, under the pressure of that news from France, the English markets had not risen so much as might reasonably have been expected. In saying that, it was not that he did not wish the agriculturists might not continue to receive full prices for their corn, but he was sure they would all be ready and willing to acknowledge that there might be prices of corn which were too high. He said, then, that there was a great obligation resting on the British farmer. No man twitted them by saying that they could do without them, but they patted him on the back, and called him a downright good fellow. The farmer had gone through a time of trial—he had shown that he was not to be beaten—and that, with an increase of difficulties, his energies had been called forth; and he (Mr. Clutterbuck) believed there never was a time in which the British agriculturist stood higher than he did at the present moment.—The Rev. J. CLUTTERBUCK, at Watlington.

Agriculture is thriving because you have made a number of improvements; and I feel convinced that though high prices may have done you good, your prosperity is less owing to these than to your great improvements. While adverting to high prices, I cannot help feeling that you must not rely on their continuance for any length of time; the war may last for a time, but I hope it may soon be brought to a termination by a just, honourable, and satisfactory peace; and you may rely on it that when its termination arrives there will be a great reaction in prices, and the only way is to make such improvements as will enable you to meet them. You must rely on your own exertions, therefore, and this is the proper time to do so. I cannot help seeing that a new era is dawning over the agricultural interest; and that there are certain laws relating to the land and the condition of the labouring classes which are fast becoming the great social questions of the day. If I may use the expression, we must look high up the tree, and endeavour, if we can—by removing all those laws and abolishing those customs which interfere with the flow of capital to the soil—to create a class of wealthy and independent landowners, and, above all, a class of independent tenants. For what tenant of independence and capital would take a farm under the absurd leases and agreements which used to be forced upon them in former days? I quite believe that by adopting courses of this kind you will do more to promote the happiness of the humble classes, and to further the objects which this society has in view. I was very much struck with a remark made some time ago by Lord Stanley—a great leader of the agricultural party, as you know—at the anniversary of the Liverpool and Manchester Agricultural Association. He said he conscientiously believed that if any man retained land in his own hands which he had not the power to improve, but the power to sell, he was a wrong-doer to the community. And he further added, to my surprise, that the community had a right to tell every one—"Either use that you have providently, or let some one else have it to use it providently." Now, gentlemen, if this is applicable to the individual, it is more applicable to the Legislature which allows

a number of laws to exist—not obsolete ones, but those strictly in force—which compel a man to keep in his own hands that which it is utterly impossible for him to improve. You will see immense tracts of land in this country uncultivated; and it may be said that the individual possessing them is prejudiced, and that he does not like to cultivate the extensive wastes because it would interfere with his hunting, and that he is averse to civilization; but the real reason is that they are in the hands of persons so strictly tied up and entailed that they cannot help themselves. And, if you consider, a person tied up in that way would be doing a great injustice to himself, though acting justly towards society, if he improved it; for every farthing of capital expended on it would be so much taken away from his younger children, and accumulating so much more upon the only one well provided for. Gentlemen, I was much struck in reading the remarks on this subject by a distinguished writer, who thus illustrates this question:—He says if a soldier inherits a machine, that machine would be useless in his hands; he sells it, it is converted into money, which is useful to him; the machine itself passes into the hands of the manufacturer, who makes use of it; and thus the wealth of the nation is increased. But according to these laws of entail, the machine would be forced to remain in the hands of the soldier, it would be useless, and the wealth of the country would consequently not receive any benefit from it. Gentlemen, we heard a great deal, at one time, of the distresses and grievances caused by the corn laws; it is a matter of history. But I am sure, however great may have been the depression and grievances, the oppression which is induced to the agricultural class, in consequence of these relics of a barbarous age, presses far more severely upon them. And I am also sure that if you had in this country a body of real owners instead of nominal owners—a body of independent tenantry willing to bring capital free to the soil, and allowed to farm it as they thought fit—it would be the surest way to increase and preserve the happiness of the community.—The Hon. Locke King, M.P., at Chertsey.

I hope now I may safely say your prospects are flourishing, and the condition of the agricultural interests is looking up I have always said—and I think the gentlemen here will agree with me—that we have always been for moderate prices, as opposed to either extremely high or extremely low prices, and I believe to that opinion we still remain faithful; and we should be glad to compound for a little lower price now if we could be sure of never going down below a remunerative price hereafter. I believe that the harvest in this country has been barely an average one, but that in America it has been very abundant, while on the continent, generally speaking, it has been rather under the average than otherwise. In France I believe they required two million quarters of wheat this year, which has no doubt materially affected our markets, especially as the Government seems to have stepped in and bought the corn to supply the people with bread. I think the advantages of this association cannot be doubted by any one who has lived any time in this part of the country, and witnessed the progress which has been made on the land on every side in the district.—The Marquis of Granby, at Waltham.

He did not think the farmers of England need fear anything from their continental neighbours. In Belgium he found farming was middling; but in France it was very indifferent. He saw very few horses in the fields; the work appeared to be done mostly with the old cow, or a few beasts, here and there; but rarely any horses. He also observed that there were very few men engaged in husbandry, chiefly women being employed; and the work was continued Sunday and working day. He saw ploughing, carting, &c., going on on the Sabbath just as on other days. Mr. Bird visited the Paris Exhibition, and spoke to a gentleman he met there about the English machines. That gentleman told him that they could not do much with the French, as the English machines were too complicated for them, they could not manage them. As to stock, Mr. Bird saw very few. In a journey of 800 miles, he did not see 800 sheep, and not 40 beasts; he did not know how they kept them during the winter, for in his journey of about 1,000 miles he did not meet with an acre of swedes—he saw about a rood. He thought he liked Old England best; for as soon as he got here, he found quite a different state of things. But he must say, and he lamented to say, that there was still a great deal of land in this country which might be greatly improved; a large quantity of land here might, he believed, be made to produce much more than it did. He did not think that Englishmen were idle; but they must do more than they had done, and keep their land clean, and they would have better crops.—Mr. Bird, at Peterborough.

It was impossible to read the reports of the speeches made at agricultural meetings in different districts without noticing the improved tone of the agricultural mind, and that those improvements which were introduced some years ago, and about which the chairman and various others had such serious doubts on the score of profit, were now being generally adopted. It was time that an effort should be made to remove from the agriculturists of the country the stigma that they were not able to feed their own population, when at the same time millions of acres were only half farmed. But from this stigma he must exempt the farmers of this neighbourhood, who took a high rank as practical agriculturists. They could not, however, form an accurate judgment of the state of farming from the neighbourhood of Witham. On the contrary, it was impossible to travel from one end of the kingdom to the other without seeing that bad farming was the rule, and good farming the exception. The application of science was therefore imperatively called for until a more satisfactory state of things could be brought about.—Mr. Mechi, at Witham.

If it were published what they got for their corn, and what amount of it was likely to come to market, every possible advantage would be given to the importer, and the buyers of corn would be always ready for them. This would no doubt be beneficial to the consumer, who would see what was likely to be the amount of produce; but as regarded the producer, with prices as they were at present, he would ask, could he do better or as well? Then why meddle with him now and injure his concerns? They were making their fortunes by farming; why should they be subjected to a private inquiry, to find out what they had got? He would ask this: Suppose that there were a number of large shops in the metropolis which at certain seasons of the year were obliged to reduce their rates for their goods to secure a sale, and that they rather stowed away their unsaleable goods, till they were wanted, in their back shops. If we wanted to know how to buy from them, we should only require to know what they had got in their back shops to sell, wait till they were forced to make a reduction of their rates, and then become their customers. He (Mr. Packe) wanted to know where the distinction was, when they wanted to know what the farmer produced, and what he had by him? There were a great many opinions upon this subject; but as at present advised, and with these documents before him—the opinions of the inspectors of ten English counties—he felt obliged to say that he should experience some difficulty in being able to acquiesce in this measure.—Mr. C. W. Packe, M.P., at Loughborough.

Accurate agricultural statistics are a great want. Some of the circumstances in past years, most trying to the farmer,

might have been avoided, had we possessed the means of judging, before the time of harvest, what would be the probable rule of prices during the sale of the produce of that particular harvest. For instance, in September and October, 1846, wheat was selling at 45s. a quarter; in May and June of the following year the produce of the same harvest was selling at 125s. a quarter. It was, therefore, clear that the needy seller who went into the market in September had to sustain additional pressure, with the further disadvantage of getting only 45s. for wheat which afterwards proved worth nearly treble that sum. We know every bale of goods that goes out, and every pound of sugar that comes into the country; yet so ignorant are we of the quantity of corn we grow, that we do not know the amount between 10,000,000 and 25,000,000; for he had heard it guessed at these two extremes.—Mr. C. Wren Hoskyns, at Leominster.

The crops last year have been turned into money, and the crops this year approach an average, which will prevent parties complaining of the harvest; they must not, however, expect that the present prices would last long, for as soon as peace was obtained prices would be lower; therefore they should not calculate on the prices they were now receiving, but should see how they could make the land produce as much as possible. They benefited themselves, as well as the community, by increasing the capabilities of the soil, and it was but justice to the agriculturists to say that agriculture had made rapid strides in late years, and especially in this district, for they could not go round the neighbourhood without seeing an immense difference and increase. Of this he was assured, that the more stock a man kept, the more corn he would grow. Grow green crops, and corn will follow.—Mr. Williams, at Abingdon.

It was a district familiar to him from his boyish days. He thought the improvements which had taken place, more especially within the last ten years, were obvious to the most casual observer. Fields which were at one time small were enlarged by the addition to them of neighbouring fields; hedges had been cut down, and great extension of cultivated land had been gained by throwing down old hedges, and by the farmers adopting a better system of cropping generally. The farm buildings in the neighbourhood, he was glad to perceive, had lately engaged the attention of the landlords, and he was quite certain that unless the landlord did provide not only commodious and roomy buildings, but well-laid-out buildings, well situated for the farmer's interest, well situated for the health of his cattle, with tanks for the collection of his manure, more especially of liquid manure, the farmer could not be expected to succeed as he ought to do.—Mr. Hornby, at Fylde.

Many people found fault with science, and declared it to be of no use to farmers. It was true that it had fallen into disrepute, because it had been taken up by some men who had a smattering of its language, but no thorough knowledge of its broad principles, and whose schemes and projects consequently proved worthless and futile. What was wanted was, that science and practice should go hand in hand—not that mistaken science should be in one field and mistaken practice in the other, but that the two should walk together in the same field, over the same ground, and enter into the same subjects. The offices of science and practice might be illustrated in this manner. Practice produced certain effects. It was, then, the office of science to explain those effects. If practice produced a first-rate crop of wheat on a piece of ground, it was the office of science to explain the conditions of the production of that crop. When science had developed those conditions, it was enabled to say to a certainty that under the same conditions the same crop could be produced for a thousand times together. Just to illustrate this a little further, suppose they took a short walk, and imagined they were in company with the said science and practice. They entered a field in which there was a large and good crop of wheat, which had been the reward of practice. Science explained the causes which had rendered practice successful in this instance. It examined the straw and the grain, and found in them all the essential constituents; it then examined all the conditions of the soil and climate, and ascertained all the circumstances under which the crop was grown. They then went into another field, where there was, to all appearance, a good crop of wheat, which was likely to yield five or six quarters; at thrashing day, however, to the great disappointment of the farmer, it gave him perhaps only five or six sacks. Science again examined the straw and the grain, and the soil, and found that certain conditions which it had noticed in the field which produced the great crop were here absent; to what conclusion, then, could science come but that those conditions were essential for the production of a large and good crop? When these investigations were repeated time after time, and were confirmed, science naturally became bold, and said—"There are the means which, if you will use them, will always produce you a good crop." He would rather not say what they had already done; he would rather content himself with saying what science might do, and what science could do. It was their aim to accomplish in practice what science indicated could be done; as yet, however, they were only starting, but at some future time he would probably be enabled to put them in possession of the results of his experiment, and perhaps some of those now present would themselves be enabled to testify to the truth of his assertions. —Mr. Jekyll, at Fenton.

He dwelt upon the importance of more attention being paid to chemistry, the study of which has led to the discovery of such great facts, especially as regards the cultivation of the soil, and the adaptation of different kinds of soil to different kinds of grain. He assured the farmers that, as regarded this and other matters, most of them all needed to go to school again, and that the sooner they made up their minds to do so the better. He reminded them that their forefathers had only one-half the number of mouths to fill that they had now, and expressed his belief that if the farmers would not set themselves to the task of providing the larger amount of food required by overgrowing population, there were able and intelligent men who would do so.—Mr. Legard, at Kirby Moorside.

There was no agricultural interest in any other country besides England, except it was America; and he was happy to see that the farmers were this year very successful in that country, for it was to them they must look to make up any deficiency at home. In noticing the present prices of corn, he said the farmers could not help having good crops this year, nor the prices being what they were. Who could say that there was any holding back of corn at the present time? Who could say that there were any artificial prices of corn at this moment? With regard to the crops of this year, although there was a slight failure in the fens and on the light soils, he considered there would be sufficient corn to maintain the country. There was a deficiency abroad, and it was that which had caused the present high prices of corn. Reference had been made to the necessity existing in farming for intellectual ability. There was not a single department in agriculture which did not tax the mental energies of the farmer to the utmost. Take the breeding of stock, for instance—how many things were to be looked at and considered, if any one would succeed in that department! Then, as to manures—why, they were regularly besieged with all manner of things which were offered to them as manures; and they needed to

be very careful, or they would be greatly cajoled out of their money for all sorts of stuff. Then, again, as to machinery—he did not wish to offend their mechanical friends who were present; but really, if they went into the shops of those gentlemen, they would try to persuade them that a whole shopful of machinery was absolutely necessary to them. Machinery was necessary; if the farmer would supersede manual labour, he must have it. By its means, the farmer was now rivalling the manufacturer, not only in the excellent manner in which they dressed and turned out their corn, but in the precision with which they did their business. If the landlords would just help them a little, and not take advantage of the present high prices of corn, he thought the farmer would do very well indeed. He hoped they would take care of the money they might gain by the present state of things, and not squander it away; for depend upon it a change would come.—Mr. WHITWELL, at Peterborough.

I have not the least doubt in the world that wherever such associations exist, those who have the curiosity to examine would find the clearest traces of evidence of the advantages which the agriculturists have derived from them. If you were to take me to some part of the country where agriculture was in the lowest possible state—take me where the implements were the worst adapted to the country for which they were required—take me where the stock is of the most uncomely and indifferent character—take me where those great operations of agriculture, ploughing and shearing, are done in the worst possible manner—I should perhaps hesitate in determining whether there must not be a very bad Government, whether the people were not in the very lowest state of ignorance, but I should be perfectly certain there was not existing in that country any agricultural association, for I should know that with the amount of knowledge and the amount of comprehension, combined with the many inducements to exertion which such associations present, there could not exist that ignorance, there could not exist that apathy. In fact, these associations, by such exhibitions as that we have this day witnessed, do in the competition present the motives to excel, and in the exhibition itself they present the means of learning how to excel.—Mr. CLEASBY, in Surrey.

There is one point to which I should like to call attention. Judging from the appearance of the Swede turnips—most important in fatting stock and carrying on the business of agriculture—I doubt whether they will preserve from the rot after Christmas, as they present a curious appearance, and any one taking them will notice dark streaks and a tendency to rot. I only found one quite sound, and I attribute this general unsoundness to their growing late in the season. I made a suggestion to-day, which I will repeat now, for securing a crop of turnips early in the year, without which the farmer is placed in a very difficult position. It is well known that after the turnip makes its appearance it is almost entirely destroyed by the flea; now, I have got a plan of cheating the flea, if you can understand such an expression. Supposing a man had a gallon of seed that he intended to sow on two acres, I would recommend you to soak half the quantity a couple of days, dry it sufficiently to mix with the other, and then sow them altogether. The seed that has been soaked will make its appearance one or two days before the other, the fly will attack it, and by the time the other comes up the first will be too old and tough for them to eat. That plan has been tried with success by a friend of mine, and I think you will agree with me that it is entitled to consideration if it can be the means of saving a crop, which is of such great importance in our agricultural operations.—Mr. BAKER, at Groombridge.

With the facilities which had lately been afforded farmers in that district for going to the Crystal Palace, and there being enabled to purchase every kind of agricultural instrument at the manufacturers' prices as in the north of England, which was one of the greatest boons that had been conferred on the agriculturists of Surrey, he had no doubt that farmers would avail themselves of it, and apply new machinery to increasing their crops. He felt confident that, from the manner in which the association was progressing, they would live to see half as much more grown per acre as at present.—Mr. KEEN, in Surrey.

If a man entered upon any business, he ought first to ascertain upon what terms he was to take it. So a farmer, on taking a farm, should first see what were his prospects. If he took a farm, fondly supposing that wheat was going to maintain an average price of from 80s. to 84s. per quarter, he would find himself very much mistaken, and he would be to blame to take a farm on such terms. Again, if he thought his landlord would take advantage of the high prices of corn, and raise his rent, he ought to have a lease. A man ought to have unbounded confidence in his landlord; and if he had not, the farmer was to blame. He thought the fairest way was to take the average price of corn for a number of years, and base the rent on that data. They knew that a short time since wheat was selling at a low price, but now it fetched a high price; and he would ask, if the landlord did not lower his rents when corn was low, why should he raise them now corn was high?—Mr. YEOMAN, at Peterborough.

In reference to the duties of landlord and tenant, proper allowances ought to be made to the tenant who had by his diligence improved his holding; but if the landlord had been at the cost of making improvements, let it be put down to his account. Where a tenant had by his industry made the land under his charge more productive than it was when he entered upon it, he had a full right to reap the benefit of his labour, without being interfered with by the agent of the landlord. An instance had lately occurred in the West Riding of the injustice of which he complained. An influential landholder having lost his agent by death, had of course to engage a successor to fulfil the duties of the appointment. The new agent had sent numerous discharges to the tenantry on the estates, and they would be obliged to seek fresh farms. No proper account had been taken of the improvements they had made during a long series of years, nor were any allowances granted to them, although many of them had increased the produce of the land to a great extent, and were as good farmere as could be found anywhere. He alluded to this subject so that all present might be able, if occasion required, to speak with confidence in the assertion of their rights before the agent. Through the medium of the press he spoke to the farmers generally throughout the country on this subject.—Mr. BURNET, at Ripley.

Agriculture had very much improved within the last few years in this county: high hedges had been transformed into low hedges and wide ditches, while drainage had been carried out to a very great extent, and with much success. Better green crops, too, were grown nowhere, or more successfully than in Herefordshire. The society also offered very great advantages in bringing the number of visitors it does to see the way in which the farmers managed their grounds. He noticed the improvements which had been recently effected in the breeding of stock, and that the Herefordshire cattle did not now appear so heavily-fleshed as they did some years ago. He did not know what they thought of the show of horses, but for his own part he saw none in the yard. He commented upon the way in which the Herefordshire farmers generally reared their colts, and upon the practice of turning both mare

and colt out into the fields, or to be fed upon bad hay. If instead of doing this they would take the same care of their breeding stock of horses as they did of their cows and calves, they would very much improve their stock, and would be surprised at the high figure it would fetch in the markets where it was required.—Mr. Kevill Davies, at Hereford.

Some persons said, "We can't show against the gentlefolks." Now he greatly objected to such an observation, for what did it imply?—that a tenant farmer could not show against an owner of land. He objected to the words "I can't," being used in any business. The man who said it, meant not to succeed. But was it true that the tenant farmer could not show against the owner? Most certainly not. Let them take short-horns, or any other description of stock, and who, he would ask, had been the improvers?—why the tenant farmers. It was said that Lord Ducie had had a wonderful sale of animals; but where did he obtain them? why his Lordship went to a northern tenant farmer for the means of improving his stock, and that tenant farmer had told him that he began in a very small way, and that it was only by his sticking to a good male animal that he brought his stock to the high state in which it was. Then again as regarded sheep; why in a contest for Southdowns a nobleman, whose name stood at the head of everything connected with agriculture, had to contend against a tenant farmer, and what was the consequence?—why he was beaten. Finding that he could not contend against the tenant farmer, his Lordship, like a sensible man, bought some of the best of his stock, and thus improved his own, so that now in all probability he could show against the world. Again, a tenant farmer at the Paris Exhibition had produced such a stock as nothing could equal, and in consequence the judges had determined that a gold medal should be specially struck for him. Away then with the notion that tenant farmers could not show against owners. And did they think the men he had been alluding to ever used the word "can't?" No, the words they used were "I can," and thus only was it that they succeeded, and that the breed of animals in this country had been brought to their present state of perfection.—Rev. J. Vane, at Wrington.

THE WHEAT CROP OF 1855.

Direct sympathy is, after all, the surest sign of friendship. You must speak and feel with a man to command his respect and attention. Sober advice or sheer reasoning rank but as little in comparison with that heartiness which makes his case your own. There is no such bid for popularity as that which promises to everybody the best of everything, or, that admits everything as wrong which anybody can be found to complain of. Your true philosopher looks only to the bright side of the picture, and sets up as Sir Oracle, by "drawing facts as they ought to be, not as they are."

There is no denying that, as a personal consideration, this is often a very successful line of policy, however dangerous a one it may be for those who place their reliance upon it. It would appear to be especially dangerous just at present. As necessarily, more or less, the accompaniment of "war prices," we have corn high and bread dear. The people, or a portion of the people, in almost utter ignorance of the collateral causes which have led to this, begin to complain, and straightway a Sir Oracle arises, and unequivocally sides with them. "We are well provided with food, and, perhaps, Great Britain never needed less of late from other countries"—this, too, despite the very high rates at which the markets have now for some time continued to range. Our authority is Mr. James Caird. At any rate he occupies that position in the *Times*, and has a fair chance of weight and influence accordingly. Here, indeed, is the mischief. Speaking through the channel he does, should Mr. Caird have made a mistake, there are hundreds and thousands who will go with him. He addresses himself directly to the popular feeling—to many who will be only too ready to credit all he says, without staying to consider how far he is warranted in doing so.

We repeat, this is especially dangerous, as we believe Mr. Caird to be essentially wrong. We give his letter in another column; but in doing so we agree with hardly one of his assumptions as to the past harvest, or the deduction he draws as to our present position. The crowning point of all this is, that we should be well content with our own resources, and that, as a consequence, we never had so little need to look abroad. Mr. Caird's facts are thus diametrically in opposition to those which may, so far, have been supposed to guide the merchant; while it would have been more satisfactory to see by what means he has arrived at them. This, however, is impossible. Mr. Caird simply jumps to conclusions with nothing more tangible than his own ipse dixit to support them. The chief of these are, that the wheat crop of this year is but little below an average, though say one-tenth; that this deficiency is far more than made up by the increased breadth of land put into wheat last seed time, say at least one-fourth more than the customary acreage; and that economy in consumption has already materially added to our stores. These are Mr. Caird's own facts, upon which he grounds his grand argument that we are in reality so well provided for, and that we want so little from other countries!

It is only right to add, that hardly one of these assumptions is in any way justified by present circumstances, and not one of them admitted by other authorities. The estimated yield of a crop must always

be a matter of some uncertainty; few, however, we believe, will now be inclined to admit this year's deficiency at anything like so small a loss as that awarded by Mr. Caird. On the other hand, his statement that we have had at least one-fourth more land in wheat, stands still more in want of corroboration, letting alone the very obvious fact that if this had not been in wheat, it would have been in some other grain, almost equally serviceable as food for the people. His third point—that economy, caused by high prices, had already added to our stores—has even less to support it. High prices have been generally accompanied by high wages. "In Lancashire, Yorkshire, Staffordshire, and Warwickshire," writes Mr. Hubback, "there has been no decrease whatever in consumption." We can answer for it, there has been none amongst the agricultural population; nor do we believe, whatever may come, there has been any such stint as yet amongst other classes.

Mr. Caird unites with these, other facts by no means so originally his own. He says, for instance, in one breath, that as we began harvest three weeks later, we must have saved three weeks' stock. In his very next sentence he comes to the very logical conclusion that, although this three weeks' consumption might be saved out of the new crop, it must have been supplied from somewhere else, and this he takes naturally enough out of what we had in hand. His great point, however, the only one that in any way warrants the high colouring he gives to our present position, is that more corn has been sent into the market during the first week of this October than in the same period during either of the two preceding years. The *Gazette* offers some proof of this, but after all by no means the most satisfactory as to the actual increase. It is well known that for the last few months the Government have been making great efforts to have the sales of corn something like properly returned. Fresh notices have been issued; and it is so only fair to conclude that this apparent increase on last year has not been so much in the corn really sent in, as in the more complete records of what has been sold. Even admitting, though, this to be as Mr. Caird puts it, what does it prove? We have more corn in the market, and still a higher price for it. If there were such supplies to fall back on, could this be reasonably supposed to continue? The corn merchants of this country have the credit of making themselves tolerably well acquainted with what there is to come; and surely, with abundance in store, economy in consumption, and so on, this high price could never be supported. One fact, still, we believe these *Gazette* returns do prove, which is, that the farmers are by no means hoarding up, and waiting for something even better yet, as many people would have us imagine. We know, on the other hand, that the thrashing-machine has been in full work ever since harvest, and that many districts are already nearly cleared out. In Essex, for instance, as elsewhere, the growers of wheat have been quite satisfied to realize at present prices.

Acting, as we are quite ready to believe, with the best intention, Mr. Caird can only look on the bright side of the question. Going so far as he does to assume that we are not an importing country, has it never struck him that we may be an exporting one? Has he never heard, for example, what good customers the French may be to us, or even that the recent decline in prices was attributed to France having come to a pause? At any rate he reads the *Times*, where, within these few days, he will find the following:—"Up to this year it was something unheard-of in the annals of trade between Prussia and England that the former should buy corn of the latter, though few years passed without her being a seller to a considerable extent; this year, however, Prussia figures as a buyer of grain from English ports, and will be very happy to hear of any other place where she can repeat the process."

The man who gives his aid to allay a panic is doing a great public service. We fear, on the contrary, that Mr. Caird's efforts would have, if any, only a reverse tendency. The ill-advised could not have a more congenial text-word than his letter, nor one whose argument was less supported by facts. The present price of corn arises in no way from any combination between the buyers or the growers. It is simply the natural result of circumstances beyond our controul. We have an unusually short supply to commence on, an increased demand both at home and abroad, and at the best but an indifferent harvest. The more we attempt to palliate this, the more trying, we fear, will our position become. Mr. Caird, unfortunately, is doing so. He is buoying up the people with false hopes, and actually striving to avert those supplies which are being provided for our future wants. We believe with Mr. Hubback—whose own commentary in another column we recommend to the careful attention of our readers—that Mr. Caird "is very far wrong, and that his letter is calculated to do a great deal of harm."

Mr. Caird's letter has been followed by at least one good effect. It has tended materially to place the agriculturists of this country in a proper position with their fellow-men. Not that such an act of justice was by any means intended. On the contrary, the grand deduction to be gathered from this Commissioner's report went to assure us that

we had plenty of corn if it were only fairly dealt out. Either directly or indirectly the argument could only come to this—the farmers were hoarding their stores, and thus keeping wheat at a price far beyond what it legitimately should be. It has been the fate, however, of Mr. Caird, to find his statements meet with an almost general contradiction. It is not only the growers or the trade who rise up against him; it is not alone the *Mark Lane Express* that is besieged with correspondents disputing every point he advances. Journalists who might perhaps be supposed to consider the question a little more broadly than ourselves are equally at issue with Mr. Caird, and equally ready to maintain that the present high prices are in no ways attributable to any fault or conspiracy on the part of the merchant or producer. Occasionally, to be sure, the *Times* may be favoured with such a letter as that from the "Lincolnshire Vicar," whose wild assumptions, still, only require the practical commentary of a man like Mr. Sturge to put them at their true value.

We had hoped by this that the bias against the English farmer had almost died out. If it has not, we must say that no man has done more to foster such a feeling than Mr. Caird. From the time he first published his high-farming pamphlet, in the tours he took and wrote as a Commissioner, down even to this journey "from the Solent to John o'Groat's," he still continues, somehow or other, to create an unfavourable impression. First of all, the Southron does not know how to farm; next, he has not the means to; and then, if at last he does reach so far, he does not know when to sell. This is the point of the last charge: a serious, if not, indeed, a positively dangerous one to make against a class at such a time, if it were not so utterly monstrous as to cause its instantaneous correction. We repeat, this does not rest with us alone; we have many amongst our contemporaries but little identified with the cause of agriculture, that as readily perceive, and confute this attempted injustice. "There is still," says the *Banker's Circular*, "a lingering grudge against the English farmer; and there are not wanting persons who catch at every opportunity to charge upon his conduct the present high price of corn. Sometimes a clergyman, and sometimes a traveller, writes to a public journal to inform the world that farmer Brown has more than an average yield of crops, and that farmer Hodge has not yet thrashed out his last year's produce, and that, therefore, it is monstrous farmers should be selling their wheat from 80s. to 90s. per qr. But what is there extraordinary in all this? Every grain-growing country in the world has been invited to come into competition with the English wheat-grower; and on the arrival of foreign grain into our ports he is denied the protection given to every other article chargeable with customs' duty under the bonding system. In 1853 the deficient harvest throughout Europe greatly diminished that competition. In 1854 the deficiency in the grain crops in the United States (which was reluctantly acknowledged in this country, by writers who had predicted very low prices), and the obstruction caused to importations from Russia by the war, very materially lessened the force of this competition during that year. The harvest of 1855 finds us in a similar position, with the exception that the crops of the United States of America have been abundant: but for this, not only England and France, but many other countries on the Continent have made a demand. *To talk of the farmers as the cause of keeping up the high price of wheat, is about as rational as to attribute the present high price of sugar to the slaves of South America.* We have passed a law that admits every corn-growing country in the world to come into our markets with its produce. We have entered upon the third year of high prices; and whatever notions may be entertained by inexperienced persons, the price of corn, like that of cotton or calico, will take its range in accordance with the supply and demand."

Again, in the *Daily News*, we find as strong a refutation:—"To maintain, as we see some writers assert, that the 303,720 farmers returned in the census as inhabiting Great Britain have entered into a combination to keep up the prices of wheat, is in the last degree absurd. Every farmer and every miller tries the one to sell and the other to buy wheat on the most favourable terms, but there can be no combination. The result, however, of their joint and mutual operations—the consequences of information gleaned from every locality, and of their knowledge of what is wanted as well as of what is harvested—the price which they settle in the market, must be a far better criterion of supply and demand than the information collected over a narrow space by any one person, or even any mere enumeration of produce, however accurate. The general rise in the market may be assumed, therefore, without further reference to conflicting statements, to be a complete answer to Mr. Caird's supposition that we shall not require much more than 1,000,000 quarters of wheat to meet our consumption this year. It is also an emphatic, practical refutation of the inflammatory letters, written by Lincolnshire vicars and other idlers, vituperating farmers and millers because the price of food is high."

And in another place:—"A great and rapid increase has taken place in shipping, trade, and manufactures; a great increase has followed in the

population to be fed from the produce of the land; they have much to give the agriculturists for food, but till their demand was manifested by a high price there was no motive to increase largely the supply, and after it has become manifest the supply cannot be immediately increased. It takes time to extend cultivation, particularly in old countries, and hence food is scarce throughout Europe, and the price in England—where these effects are first and most strongly felt—is higher than it has been for 36 years. It was quite impossible for agriculture to prepare beforehand for such an increased demand, and very difficult, or almost impossible, for it now, everywhere subjected as it is in the old world to numerous artificial restrictions, at once to feed the increased and increasing number of people. This food question, therefore, cannot be solved by looking only to Hyde-park or a parish in Lincolnshire, nor even by collecting statistics of the produce of England, or looking at the price in Mark-lane, though this is the surest indication of our present condition and our future prospects. It is a world-wide question. Commerce now unites all the people of the earth in the pursuit of wealth, however widely they may be politically separated; and we have all a common interest in the good cultivation of the soil in every country. The dearness we deplore commences chiefly in the gold discoveries, which have spread an almost mad delight through all society, and have everywhere kindled energy and enterprise."

The *Morning Post* speaks quite as plainly to the prejudice which might be thus engendered:—"Estimates of this kind are apt to do mischief in more ways than one. They raise anticipations which cannot be realized; and they create, moreover, among the thoughtless and unreflecting the most absurd prejudices against the agriculturists, who, since the appearance of Mr. Caird's letter, have been subjected to no small amount of vituperation by anonymous correspondents in the newspapers, upon the score of their keeping up prices by keeping back their produce from the market. We have even read with surprise and regret communications purporting to come from clergymen upon this subject. So long, however, as we are without any means of ascertaining correctly the productive powers of the kingdom, pretenders to superior information will make estimates, and even gain believers. Mr. Sturge quietly remarks, that if Mr. Caird, instead of giving us a column of statistics, had furnished us with the results of his observation and experience upon his own farm, he would have rendered far more service to the cause of agriculture. With this view of the matter we cordially agree."

The high price of wheat is, in fact, now a nation's and not a farmer's question. It is admitted the latter has done almost all that could in reason have been expected of him. So far either from unfairly profiting by any scarcity a bad harvest may have led to, Mr. Caird's own figures show that the grower has already this season thrashed out and sent in more corn than ever. It is not our purpose here, however, to further consider this letter; but in justice chiefly to our subscribers, we think it right to show how thoroughly our views are supported by others who might not have the case of the farmer quite so much at heart as ourselves. Even the *Times* has in Mr. Sturge's letter, to which we have already referred, given a nearly general contradiction to the estimates of their own correspondent: "I satisfied myself that the produce of their wheat crop would not be half as much as the previous season." "I entirely differ with James Caird as to the breadth of land under wheat being greater than last year, or one-fourth more than an average." "The extra quantity returned as sold since harvest I attribute entirely to more pressure having been put on by the Excise," and so on. This letter will be found in another column.

We give with this a number of letters from our own correspondents, all tending to the same end. We should add that we have not suppressed one in any way agreeing with Mr. Caird's statements. Had we received anything of the kind, we should have readily afforded it insertion. Our only aim is to arrive at the truth, and this must be our reason for devoting so much of our space to Mr. Caird. We repeat that we believe him to have been essentially wrong; while placed in the high position he was, with all the weight of the *Times* to circulate his opinions, we felt that if wrong, and allowed to remain uncorrected, he might do a great deal of harm. It was even asserted that the appearance of his letter caused a rise in the Funds; although it might also be as fairly said it caused a rise in the price of wheat, an event which followed on the Monday succeeding the publication of his opinions. This of itself would show how little even was its immediate effect. Introduced through any other channel, such a communication would, no doubt, have commanded but little attention. Coming, however, where and at the time it did, it was a duty to denounce its fallacies; and we by no means regret the discussion to which it has given rise. "Out of evil cometh good."

TO THE EDITOR THE TIMES.

SIR,—In the continued absence of authentic agricultural

statistics it is not surprising that the uncertainty regarding the productiveness of the last harvest should cause much public anxiety. At the same time last year, and under similar circumstances, I published in your columns an estimate of the crops, the accuracy of which has been singularly verified by the result; and, as I have this year had unusual opportunities of observation (having since harvest traversed the entire island from the Solent to John o'Groat's), I venture again to submit an estimate of the wheat crop of 1855, which will, I trust, in some measure contribute to allay the public anxiety on the food question.

The English wheat crop of 1854 proved one of the best on record. It appeared a large crop at harvest, but it thrashed out even better than it promised. The fineness of the harvest weather perfected a bountiful crop. This was followed by a continuance of the same propitious weather during seed time, and, as wheat was then selling at such a price as most farmers hardly expected to see again, every acre that could be got ready was sown with wheat. So much for the autumn seed time. When spring came one bushel of wheat was worth two of barley, and the advantage was plain enough of substituting the one crop for the other wherever practicable. Accordingly an unusually large breadth of spring wheat was sown last season. If we suppose that only one-fourth of the usual breadth of barley land was sown with wheat, that, on the four course system, would add one-fourth to the average breadth of land under wheat.

The weather during May and June was too cold for the wheat crop, with late frosts; and at this period the crop suffered considerably, especially in the south. It was fully fourteen days later than usual in coming into ear, in some places three weeks. But July was warm and forcing, and the weather on the whole was favourable while the crop was in bloom. Towards the end of the month the effect of blight made its appearance, and it then became manifest that the ear was partially defective. On the 4th of August harvest was commenced on the Sussex coast, by the 15th it was general over the south of England, and during the next six weeks the weather was everything that could be wished for the cutting and in-gathering of the crops throughout the kingdom. Within that time all the valuable wheat crops were secured, and in excellent order.

The crop has now been tested in all parts of England, and, while the yield is found to fall considerably short of the great crop of last year, and in some particular districts, owing to special circumstances, is very defective, yet, on the whole, it is believed to be nearly an average produce per acre over much beyond an average surface. The farmers' deliveries of wheat in the various English markets during the first week of October for the last three years, as shown by the *Gazette*, are a pretty accurate indication of the correctness of this conclusion. For the week ending October 6 the wheat delivered was—

1853.	1854.	1855.
Qrs.	Qrs.	Qrs.
95,494	151,801	155,921

From these figures we should be almost justified in assuming that any defect in the yield is compensated by the increased breadth under crop.

I am inclined, however—and I think it will be a prudent calculation—to assume that the yield of the last wheat crop is something below an average. We may take it at one-tenth, and then with the foregoing *data* we have the following results as the produce of 1855, viz.:—

	Qrs.
Average wheat crop of the United Kingdom	13,500,000
To which add one-fourth for increased breadth sown in consequence of high prices, a favourable seed time, and a liberal use of guano	3,375,000
	16,875,000
Deduct one-tenth for defective yield of last crop..	1,687,500
Total estimated wheat crop of 1855.....	15,187,500
Estimated annual consumption of the United Kingdom	18,000,000
Apparent deficiency to be supplied from abroad..	2,812,500

which is little more than one-half of the average annual importation of the last five years.

But there are two important circumstances to be taken into account which will materially diminish this apparent deficiency—the lateness of the harvest and the economy of consumption caused by high prices. The harvest was three weeks later than usual, and we may thus save three weeks' consumption of the present crop. This saving, however, is not one on which it would be prudent to reckon, for in the same degree the stock of old corn in the country must have been diminished; and a greater margin than this will always be required on hand to meet unforeseen contingencies. But the economy of food caused by high prices is self-evident to every one, and, if we take it at one-tenth, there will remain little more than 1,000,000 quarters of wheat and flour for which we shall be dependent on foreign supply.

There can be little doubt that the present range of prices will procure this supply from America and Egypt alone, even should the northern European ports be closed against us by the defective crops and high prices anticipated abroad.

Now, if these figures could be relied upon, there would be no further anxiety on the food question. I cannot, however, ask for them any greater dependence than may be given to the result of individual inquiry and observation and a pretty accurate knowledge of all the wheat-growing districts of Great Britain. It will be obvious to those who have studied the question that the result of this estimate is mainly governed by the supposed increased breadth of land sown with wheat last season. If my estimate should prove accurate, the present price of wheat is not likely to be maintained. But if I have materially erred in this, the deficiency may prove very serious. Is this a question that should any longer be left to doubt and uncertainty? The evidence taken by the Lords' Committee on Agricultural Statistics last session conclusively proved the practicability of obtaining accurate returns of the acreage under each crop in the kingdom, which, if at present in operation, might have been published six weeks ago, and would at once have given certainty to the trade in corn, now fluctuating with every new rumour from week to week. The present average price of wheat is exactly 20s. a-quarter higher than it was at this time last year! Each month's consumption is thus costing the country £1,500,000 more than it did then; and yet successive Governments hesitate about an outlay of some £30,000 to obtain accurate returns, which would calm public anxiety as to the supply of food, and would remove that uncertainty and apprehension which alarms public credit and paralyzes trade. Of all the mistaken economies ever committed by a great nation there has never been one more delusive than to grudge the cost of ascertaining facts upon which the trade and welfare of the country are so much dependent.

JAMES CAIRD.

6, *Serjeant's Inn, Temple, Oct.* 29.

[We willingly give insertion to the following letter, which has been specially forwarded to us for that purpose. The writer is well qualified, from his position, to command the attention of those he addresses. Mr. Hubback is publicly known as Chairman of the Association of the Liverpool Corn Trade; he is also a Trustee of the Liverpool Docks, and a tenant-farmer of 3,000 acres. Mr. Caird's letter will be found in another column.—Ed. M. L. E.]

TO JAMES CAIRD, ESQ.

My dear Sir,—Your letter in to-day's *Times* I have read with interest. While, like yourself, deploring the want of correct agricultural statistics, I cannot allow to pass unnoticed the conclusion you come to, viz.—that an import of little more than 1,000,000 qrs. of wheat and flour will suffice for the wants of the country up to next harvest. My humble opinion is that you are very far wrong, and that your letter, which no doubt will carry much weight with it, is calculated to do a great deal of harm. Unless my judgment very much deceives me, every effort will be required to bring into this country a sufficiency of food to meet our wants up to the harvest of 1856.

Now, without either agreeing to, or dissenting from, your figures of 13,500,000 qrs. as an average crop, and 18,000,000 as our annual consumption, which numbers, after all, are purely ideal, I will just direct your attention to certain facts.

On the 1st September, 1854, the stock of old Wheat and Flour, English and foreign together, in the United Kingdom, was known to be very considerable. The crop of 1854 was, on your own admission, "one of the best on record." From the 1st September, 1854, to the 1st September, 1855, there have been imported 3,885,211 qrs. of wheat and flour. I ask, therefore, what has become of the old stock, the large crop, and this large import? All, or nearly all, has been consumed; for I believe it is generally admitted that seldom has this country entered on the consumption of a new crop with so small an old stock on hand, as was the case on the 1st September last.

With reference to the present crop, you assume, from the weekly returns on the 6th October, 1855, as compared with 1854, that any deficiency in the yield is compensated by the increased breadth of land under crop. Permit me to remind you that since June last the returns have been more closely looked after than for some time previously. A fresh notice was then issued by Government, threatening to put the penalty in force should the buyer not comply with the law requiring full and perfect returns of all their purchases. The increase in the quantity returned since June last, from this cause, has been variously estimated, say from 15 to 20 per cent.

With submission, I think your estimate of the increased breadth sown far too large. In autumn, last year, there was no inducement; prices, you will recollect, were comparatively low in September; the aggregate average for the six weeks ending the 14th October was 55s. 8d. per qr.: you admit in your letter a difference, compared with present rates, of 20s. per qr. If the extra breadth was sown in spring on barley land, as you allege, we must have sooner or later a corresponding deficiency in the deliveries of barley; at present, there is none. Take the same week (6th October) as that which you have selected for judging of the wheat crop, and what are the returns?—

1853.	1854.	1855.
44,197 qrs.	21,169 qrs.	21,588 qrs.

From my own experience as a farmer, however, I think it impossible to conjecture, with any approach to certainty, how much barley land could be appropriated to wheat, no matter how great the inducement might be—unless the season was propitious the thing *could* not be done. But, supposing the weather was favourable, what proportion does the land under barley bear in many places to the whole breadth sown with wheat? In Scotland, according to the Highland Society's return, there is rather more land under barley than wheat; but in England and Ireland there is, according to the best known estimates, a very much larger proportion of wheat than barley; probably about in the proportion of 3 to 1. It would therefore require that, to make up your increased estimate of 3,375,000 qrs., nearly *three-fourths* of all the land usually sown with barley (in England at least) must, last spring, have been put in wheat. But does any one suppose that such an increased breadth was so appropriated?

There is, permit me to remark, some little confusion in your summary of the sources from whence you derive the supposed increase of 3,375,000 qrs. of wheat. If one-fourth more breadth has been sown, the extra land ought to give all the increase; and the most that can be ascribed to "a favourable seed-time and a liberal use of guano," is, that it has made the acknowledged deficiency *less* than it otherwise would have been.

You estimate the economy of food, in consequence of high prices, at ten per cent. As far, however, as Lancashire, Yorkshire, Staffordshire, and Warwickshire are concerned, there is, I believe, as yet no decrease whatever in the consumption. The great body of the people are well employed and well paid; hence the *fulness* with which they live. Millers attending this market say that the demand for flour was seldom greater than at present.

Without attempting to estimate in figures this year's crop, one thing I know by my own experience—that whether as regards the actual yield per acre, or the quality of the grain judged by hundreds of samples which I have handled, it is *very much inferior* to that of last year. The extra breadth sown cannot, I conceive, make up the deficiency.

Bearing, therefore, in mind the comparatively large stock on the 1st September, 1854, the excellent harvest of that year, and the large import since, I consider that the position of the country was worse by at least 2,000,000 qrs. of wheat on the 1st of September this year than on the same day 1854. If this be an opinion at all approaching to correctness, we shall require, after allowing for a possible decrease in consumption, an import of from 4,500,000 to 5,000,000 qrs. before the

1st September, 1856, to place us in as good a position regarding stock as we were this year at the same time.

In conclusion, even supposing all your statements to be correct, allow me to direct your attention to what I consider an oversight on your part. If 3,375,000 qrs. of wheat have been grown this year on land originally intended for barley, there must be a corresponding, in fact a greater, deficiency in this grain. You are aware that in many districts barley is used for human food What is to be the substitute?

Believe me, my dear sir, yours faithfully,

Liverpool, Oct. 30. JOSEPH HUBBACK.

SIR,—In Mr. Caird's letter to the *Times*, upon the subject of the yield of the last harvest, I see that one of the grounds on which he rests his argument of the prolific nature of this year's crop is, that the quantity brought to market in the month of October (this year) far exceeds that sold in the same month of the two previous years. I think Mr. Caird has over looked in his argument the great increase in the number of steam thrashing machines, and the consequent greater facility enjoyed by the farmers in thrashing out, when tempted to do so by the present price.

I am confident that in this county the number of steam thrashing machines has doubled in the last year. I know from my own experience that they are so fully engaged that one cannot be secured under three weeks' notice.

I further believe that more wheat has been already thrashed out this year than would have been the case up to Christmas in any previous season. I am, Sir,

AN OLD SUBSCRIBER.

Thrapston, Nov. 3, 1855.

SIR,—Like my brother clodpoles, I sometimes read the "news," and have done so for many a year, particularly on subjects relating to my own business, which is that of a farmer; and in such reading I have remarked that every autumn an article or letter appears professing to estimate the prospects for the coming year as regards the produce of wheat, and in this article or letter we are *invariably* told that "a much larger breadth of land was sown with wheat last season than was ever known before." This was so urged upon our attention in '54, that I came to the conclusion that the inevitable consequence must be an awful fallow in '55! but autumn comes round again, and here is the letter from Mr. Caird assuring us that no less than "one-fourth" more wheat was sown in '55 than in '54!

Now, having been a farmer by trade for upwards of twenty years, of course I am quite accustomed to hearing that I know nothing at all about it. I therefore seek for information; and the great encouragement is left me that on the very point of my own deficiency every one else seems singularly well-informed, and better than all, is ready with an amiable eagerness to give me his advice. Why we alone, of all trades, should be chosen for such kind consideration, I cannot conceive; for though I daily see "Hints for Farmers," "Figures for Farmers," "Directions for December," &c., I *never* see "Figures for Dancing-masters," or "Hints to Hatters!" Still, as we *are* so selected for instruction, will some good clergyman or agricultural tailor or dressing-case maker inform me how to stretch my land and grow "one-fourth" more wheat this year than last? I am acquainted with some of our wheat-growing counties, particularly Norfolk, Essex, and Lincoln, and I can truly say that I never met with an instance of a man, intending to hold his farm, who for the sake of growing more wheat one year than another would throw his land out of rotation. My own farm is managed on the "four-course" system; and in October I find one-fourth growing turnips, one-fourth young seeds, one-fourth wheat-stubble, and one-fourth old seeds breaking up for wheat. Now where is my "increased breadth" to come from? Are my turnips or young seeds to be ploughed in and my sheep sold? Or are my stubbles to be sown again, and my guano-bill produced as a vindication for throwing my farm into utter confusion? But why should I try to prove what every practical farmer *knows* to be a fallacy? Some men in warm and favoured situations may grow wheat after turnips; but on most soils and in most seasons such liberties would prove a poor profit, and seldom be repeated. And if, according to the "*Times* Commissioner," "guano is as yet but little used throughout England," where, I ask, *can* Mr. Caird find his wonderful increase of "*one-fourth*"? One-twentieth would be twice too much; and depend upon it, Mr. Editor, if such are the grounds upon which the grand consuming masses of England—"grand" in their vastness—are to stand at ease regarding their food for the coming year, the sooner some authorized statistical returns take the place of Mr. Caird's figures the better; and it will then be seen how far this marvellous elasticity in the "breadth of wheat" is a matter of fact or a fiction.

I am, sir, your obedient servant,

Nov. 7, 1855. G. S.

SIR,—In the absence of any official data on which we can rely as to the supply of corn, I cannot help thinking that something might be learnt if some of your farming readers would give the result of their experience in the produce of their crops for any given year. For instance, I have now thrashed out the whole of my crops of the harvest of 1854, and this is the produce:—

A.	R.	CROP.	QRS.	BUSH.
69	0	Wheat	367	4
44	2	Barley	278	4
10	0	Oats	72	0
17	0	Beans	104	2
10	0	Peas	51	5

Now, from these facts it would not be difficult to give a probable estimate of the produce of this year's harvest, which I shall be happy to send, if you think my idea a useful one.

I had this year eighty acres under wheat, an increase of ten acres upon my usual average; but Mr. Caird's idea of there being an increase of *one-fourth* in the breadth of land under wheat is manifestly a most exaggerated view, as must be evident to any practical farmer.

I am, sir, your obedient servant,

Nov. 8. A NORTHAMPTONSHIRE FARMER.

DEAR SIR,—Having been a subscriber to your valuable journal for nine years past, allow me to ask Mr. Caird, through the medium of your columns, if he takes 155,921 qrs. as the

average weekly quantity of wheat for fifty-two weeks (1855)? because if he does, I apprehend he is under a great mistake.

Mr. Caird's quantity is	13,500,000
155,921 × 52 is=	8,107,892
	5,392,108

My object is not controversy, but truth; the above figures show an over-estimate by Mr. Caird of above 5,000,000 qrs, which is an item not to be overlooked.

I am, dear sir, yours truly,

East Bergholt, Nov. 9. AN OLD SUBSCRIBER.

SIR,—In writing upon a subject so important—so momentous at this moment—as the food of the people, much care and circumspection is requisite; and in addressing you as the Editor of the great organ of the Corn trade, I am sincerely anxious that this feeling should have its due influence on the remarks which I beg most respectfully to address to you; and I feel assured that every reader of your paper will have recognized the same spirit evidenced in your weekly and talented "Review of the British and Foreign Corn Trade."

I now come more particularly to the subject of my letter—the results of the recent harvest, as regards the wheat crop, and the conclusions in reference thereto which have been arrived at by one who by his connection and his various communications with the leading journal of this country, has been received as an authority on agricultural subjects: I need scarcely say that I allude to Mr. Caird. Permit me, however, Mr. Editor, to observe that we live in times when from the increased facilities for travelling, and for the obtaining of information generally, the opinion of an individual, although he may have travelled from "the Solent to John o'Groats," will, upon a subject so important and so complicated as that of corn, be received with caution, and at the same time his inferences and conclusions duly weighed and contrasted by the observation and experience of other individuals who may have had similar opportunities of investigation.

I will now, as briefly as possible, review some of the positions and also the arguments advanced by Mr. Caird in his letter, which first appeared in the columns of the *Times*, although from the able refutation given to them in your columns it might almost seem superfluous to enlarge upon the subject.

Mr. Caird begins by observing that the wheat crop of 1854 was the best on record, and which I believe there is not an individual in the country who will attempt to gainsay. And I would further add that that providential and extreme productiveness was unquestionably the means of sparing this country from a state of great difficulty and privation as regards the staple food of the people. The American harvest (our only resource) having proved sadly deficient. But I differ in toto from Mr. Caird when he assumes that a much larger quantity was sown in 1854 than in the preceding year, and for this reason, that in consequence of the unfavourable seed-time in the autumn of 1852 (which might almost from its unexampled wetness be denominated the year of the deluge, and which at the same time laid low the hopes and anticipations of many of our first-class farmers—the men who use guano), an immense proportion of land intended for wheat was obliged to be sown in the spring of the succeeding year. From the very wet state of the soil until a late period, a great bulk of this land was eventually sown with either oats, barley, or some pulse crop; and consequently, in the succeeding autumn of 1853, this extra quantity of land was brought under wheat. Now was there not every inducement, even at that time, from the greatly deficient crop of the previous year, and the consequent enhancement of price, to sow every possible acre? Why, the fact is, that in the wet season alluded to, in many parishes not one-tenth of the usual quantity could possibly be sown, and, as a natural consequence, in the following year, an increased proportion would be grown; but it must be palpable to every one that there could be no repetitition of this in the succeeding year—in the autumn of 1854.

As regards the additional quantity sown in the spring of 1855, the single circumstance of the long continuance of the frost and snow at once refutes it; in fact, the proper season, from this cause, being too far advanced to permit of it. When, therefore, Mr. Caird alludes to one-fourth of the land intended for barley having, in the spring of 1855, been sown with wheat, I sincerely and most conscientiously believe that he advances one of the greatest possible fallacies that could be employed.

Mr. Caird then goes on to state that the weather was too cold for the wheats in May and June:—speaks of the fine weather for the blooming in July, but that at the latter end of that month mildew presented itself. But how is it, Mr. Editor, that he has altogether omitted to notice the fearful and most disastrous storms of wind and rain which occurred throughout the whole length and breadth of the land prior to the harvest, and which almost, as it were by one "fell swoop," laid prostrate all the crops upon rich and highly cultivated soils, reducing the yield in many cases fully one-half, and fearfully deteriorating the quality? Surely, Mr. Editor, some slight mention ought to have been made of this, by a person in the position of Mr. Caird.

Mr. Caird then proceeds to show the farmers' deliveries of the last three seasons for the week ending Oct. 6, and draws an inference therefrom that this is tolerably conclusive of the correctness of his hypothesis, "of an average produce over much beyond an average surface;" and from such *data* observes, "that from these figures we shall almost be justified in assuming that any defect in the yield is fully compensated by the great breadth under crop."

Now, I would ask any reasonable or reflecting man whether there may not be a variety of causes to occasion the quantity of corn (as alluded to in the returns in 1854-55) pretty nearly to assimilate, without having any reference to the crop of 1855; for, even supposing (for the sake of argument) that a farmer has grown 10 or 20 acres, more or less, of wheat upon his farm this year than in the preceding one, this I contend, is no reason whatever why he should be induced to thrash an additional quantity in the autumn; and my own experience tells me that this has nothing to do with it. I apprehend that the far more probable cause is, that from 15 to 20 per cent. more machines have been at work in the country than at any antecedent period. Moreover, they have unquestionably been worked up to the maximum point; the *animus* for this excess of thrashing, no doubt, arising from the high price which has been so steadily maintained for wheats since the harvest. And when we further consider that much more diligence has been exercised as regards the farmers' deliveries of this year than the preceding one, we must not forget that the remains of the magnificent crop of 1854 has also had some share in realizing the quantity shown in the returns which Mr. Caird has brought before the notice of the public, in order to show the results of the late harvest. I believe that I may say that the great majority of practical men in the country are opposed to his views; and it will be well if Mr. Caird himself does not discover his mistake. "Facts are stubborn things;" upon these we shall stand; and whether Mr. Caird or any other authority preaches scarcity or plenty, I am of opinion that it will not have the slighest effect upon our markets. We are

doing our duty as farmers in thrashing to the extent of our ability and sending our corn into the market, and at the same time our ports are wide open. What more can be done?

There is one further remark in Mr. Caird's letter which I cannot willingly pass over, viz., that if we had had agricultural statistics, and which *might* have been published six weeks ago, they "would at once have given certainty to the trade in corn. What certainty I am totally at a loss to decipher; the word never has, and in my opinion never will, apply to a trade which, from the various circumstances and undefinable causes operating upon it, must ever remain fluctuating. At a time like the present more particularly, agricultural statistics could be of little value, and for this reason, that so variable are the crops that even the farmer himself, however much he might be desirous to do so, would not be able to define his yield near enough to make statistics available for anything really satisfactory or reliable, in the district in which I reside. The thrashing machine is our only mode of calculation in such a season.

A Lincolnshire Farmer of Twenty Years' standing.

Sir,—I have perused with interest J. Caird's letter; and, although fully agreeing with him as to the want of statistics in the corn trade, I cannot concur in the opinions which he has substituted for this deficiency. My view coincides more fully with the evidently practical observations of your correspondent, J. Hubback; and I think, with him, that the most serious consequences would be likely to result from an overestimate, than the reverse, of our resources. Having now been about thirty-five years in the trade, and during that time studied yearly the growth and yield of the crops (more particularly the past few years), you will, perhaps, excuse my addressing you on this occasion.

J. Caird lays some stress on the harvest being three weeks later; but if he will look to the stock of foreign wheat at the different ports last year, and compare it with the stock this year, he will find the difference to be more than three weeks' consumption, to say nothing of the larger quantity then afloat as compared with this year: the old wheat in farmers' hands I believe to be much the same; but the millers' and bakers' stocks were extremely light, and have so continued. Admitting that our returns are more, the greater stringency of the inspectors account for this; if it did not, it would rather prove a free delivery than a large crop. There only remains to establish the views taken by J. Caird as to the supposed increased breadth. Of course this is only conjecture, and I believe it cannot, under any circumstances, make up over half the deficiency in flour this year as compared with the last. One source will help us, no doubt—both the crop and quantity of acres to potatoes are much greater this year than last. But, against this, barley, which from its fine quality last year added greatly to human food, this year is not only inferior in weight and quality, but likely to be 1s. to 1s. 6d. dearer than last (best qualities).

We must not shut our eyes to the fact that it is only a lessened consumption and a larger importation than last year that will enable us to meet another harvest without a real scarcity. I should be glad to be mistaken; but no one can say when the deficiency will be most sensibly felt. Before it comes our market may be overstocked, and prices, for a time, brought down of our own growth; still it may prove a serious calamity if importation be unduly discouraged by unfounded expectations. Surely our present state as regards the principal means of subsistence must result in some arrangement for more certainly ascertaining our yearly wants and resources.

Nov. 9. Your Correspondent from S—.

Sir,—The crops of this district, with the exception of a few beans, have been secured, and we briefly record the result.

Wheat went into the ground well, and promised favourably all through spring, but during and immediately subsequent to flowering time, its maturity was checked by the beating down of heavy crops, and atmospheric influences, and from the vital injury then received it never, as a crop, recovered.

We have consequently a large variety of quality and weight, ranging from 56 to 62 lbs. per bushel. Comparison with the crop of 1854 is out of the question; that, taken as a whole, being probably the largest crop on record, but as compared with an average of years we are decidedly of opinion we are deficient a full fourth; nor, although it is quite true that the high prices of 1854 would give the farmer a disposition to put as much land under wheat as he could, have we any faith in the idea that this grain was sown to such an extra extent as to appreciably counteract the deficiency of the crop.

As regards the result of the harvest of the United Kingdom, it is a bold thing, certainly, to differ from an intelligent and observing gentleman, who, *specially commissioned*, has "since harvest traversed the entire island, from the Solent to John O'Groats;" but, deriving our information from the reports of careful, practical, reliable correspondents, in every district of the Kingdom, and whose accuracy we have for many years found most complete, we have arrived at a conclusion wholly opposite to Mr. Caird's, and believe that, making every allowance for extra breadth, either of autumn or spring sown wheat, the crop as a whole, taking into account the deficient yield of flour from a given weight of wheat, is fully one-eighth—we think more—below an average crop; and if we adopt Mr. Caird's statistics of the annual consumption of the

United Kingdom being.....		18,000,000
And an average crop.....	13,500,000	
Then, deducting one-eighth	1,687,500	
		11,812,500
We have to provide for a deficiency of..		6,187,500

Against this we have to place the stock of English wheat held at harvest time (which was most insignificant), two to three weeks' consumption saved from the present crop by the lateness of its in-gathering, a vast increase in the quantity and quality of the potato crop, and that economy of consumption which extreme high prices naturally beget. Making full allowance, however, for each of these points, we clearly require an import (or the adoption of other substitutes for ordinary food, such as rice, Indian Corn, &c.) *very considerably* beyond the 1,000,000 qrs. estimated by Mr. Caird, and surely it is the wisest and the safest plan at once to look our difficulties in the face, and set in motion every element which can contribute to avert distress and famine from our shores; for, severely pressing as is the present price of the quartern loaf to nine tenths of our population, that pressure may become more intolerable, if through a vague idea that prices of grain are too high the enterprise of the merchant receives a check, and energetic endeavours to draw supplies from every available quarter of the world be arrested. It may seem a strong view, but it is one of honest conviction, namely—that if we had peace to-morrow, and the screw of Threadneedle-street at once rapidly moved in an opposite direction to its present one, we should still—looking, at the deficiency in those countries from whence we draw our usual supplies, the devastation caused by war, and the competition of France, Belgium, &c.—require every bushel of grain the United States could spare us, and see a high range of prices prevail, after probably a very temporary panic.

There probably never was a time during the present century

when economy in the use of every article of food was more incumbent upon all classes than the present, or when an example in this direction on the part of the higher classes to their more humble brethren was more needful.

On one point we are glad to agree with Mr. Caird, namely, the paramount necessity which exists for some nearer approach to a system of agricultural statistics than we at present possess. The evidence given before the Lords' Committee shews *it can be done*, and we trust ere another harvest our executive will say, *it shall be done*.

During the month we have had an active trade in wheat. Farmers have thrashed freely of the new crop, and consumptive demand has taken it all off, while for old wheat, both English and foreign, there has been a brisk competition between our millers and those from distant parts, chiefly Scotland. Unfortunately our stocks, now not over 8 to 10,000 qrs., afford little scope for extended business, and our farmers seem cleared out of old English. Of flour, also, our stocks are small, not over 1,500 barrels American, but of good quality and favourite brands.

Barley is considered a good crop, and above an average; quality also fair, though there is a good deal of coarse and stained. It is in active demand, for distillery as well as malting purposes. It is also being much used for human food, and, by a new mode of preparation, for sizing purposes. The stock of foreign in the port is about 3,000 qrs.

Oats are a deficient crop, and likely to be dearer; here again we have but moderate stocks.

Beans, where secured, are good in quality and yield well; but a good many are still out, and must suffer from the present excess of wet, and night frosts. Our stock of this pulse is somewhat in excess of last year, but likely to be all wanted.

Peas are reported as almost a failure, and we have very few in warehouse.

Linseed and its products have been dull during the month and have felt the tightness of the money market more than any other article in our line, but a more cheerful feeling is perceptible, and when the true position is calmly considered, not without reason. We seem to enter upon the winter season with almost unprecedented low stocks of seed, carefully estimated at 23,000 qrs. as against 70,000 qrs. last year at the corresponding period, and with a known consumption of about 18,000 qrs. per month, to meet which a most inadequate supply seems provided. As regards cakes, our anticipations of high prices are being fully realized, as already £14 has been paid to our crack crusher, and other makers are holding for the same figure. We are, Sir, your most obedient servants,

TAYLOR AND BRIGHT.

Hull, November 6th, 1855.

TO THE EDITOR OF THE TIMES.

SIR,—I shall feel obliged by the insertion of the following, in reply to James Caird's letter:—

Although I went over some large corn-growing districts before harvest, during the harvesting, and subsequently, I certainly did not visit "John o'Groat's," being ignorant that any wheat was grown there; but I crossed the Solent more than once, and by handling the sheaves, rubbing out the corn, &c., satisfied myself that the farmers were correct in stating, as they generally did in that quarter, that the produce of their wheat crop would not be half as much as the previous season.

I entirely differ from James Caird as to the breadth of land under wheat being greater than last year, or one-fourth more than an average; for, owing to the comparatively small quantity sown in 1852-3, the largest extent of land a proper rotation of crops will allow of was applied to wheat in 1853-4, and therefore could not again be planted with that grain in 1854-5. I think this is corroborated by the present abundance and relative cheapness of barley, notwithstanding the cessation of imports, averaging near 20,000 quarters per week since 1846, and although we have now some export to Holland, &c.; likewise a large quantity in some districts is being ground with wheat.

On my own farm, with every desire to sow as much wheat as possible, I was unable, for the foregoing reason, to plant as many acres (of wheat) in 1854 as in 1853. As to the yield, I have the last week thrashed four fields of wheat, one of red Lammas, another of mummy, a third Talavera, the fourth Scotch white, and the average produce is 14 imperial bushels per acre, against 36 bushels per acre last year: and, as I own a travelling steam-thrashing machine, I have an opportunity of knowing that my case is not an exception in the neighbourhood. At the same time I freely admit that I know of some good crops in the counties of Worcester, Gloucester, Salop, Northampton, &c., which have been proved to be so on thrashing; but in only one instance does the produce amount to within 10 per cent. of what was grown on the same farms last year. James Caird states that the deficiency may be made up from America and Egypt, but the export from the latter is prohibited after the 6th of January next.

The extra quantity returned as sold since harvest I attribute entirely to more pressure having been put by the Excise on their collectors of returns.

In one point I fully agree with James Caird—that is, the decrease in consumption in consequence of the high price, and I think his estimate from this cause is less than the reality, which alone may prevent prices going much, if any, higher.

If James Caird had in this instance, as on former occasions (at least, I believe him to be the same person) when writing on agricultural subjects, given to the world, through *The Times*, the result on his own farm, I should have placed more reliance upon it than his whole column of opinions.

I am, respectfully,

CHARLES STURGE,

Of the firm of Joseph and Charles Sturge.

Birmingham, 11th month, 6.

PRODUCTS OF AGRICULTURE FOR THE PRESENT YEAR IN THE UNITED STATES.

New York, Oct. 23.

The eyes of the world have for twelve months been directed towards Sebastopol. Few events in other quarters of the globe, however important in themselves, have been able to unrivet the gaze of mankind from that field of heroism and blood. None of the affairs of this continent have awakened so deep an interest, even among our own people, as the fortunes of the allied armies in the Crimea. American news was no longer—except by a few—looked forward to with impatience or read with interest. With the adjournment of Congress in the spring, the usual lull in our political atmosphere succeeded, and the prospects of agriculture occupied the public mind, to the exclusion of almost every other subject of domestic concern. We were living upon the husbanded fragments of a year of famine.

Only once or twice in our history had the products of the soil seemed so inadequate to the wants of the population; never but once or twice had breadstuffs and the necessaries of life reached such prices.

Had it not been for the great channels of intercourse which the genius of American enterprise has opened into the rich agricultural regions of the west, starvation would have stared the Atlantic sea-board in the face. At this crisis, when nearly all the canals and navigable rivers of the United States were shut up by the ice, we saw the incalculable value of twenty thousand miles of railway, which brought, in the dead of winter, the products of the soil to our eastern doors from the great basin of the Mississippi. But even these channels of communication were found unequal to the enormous burden—although the railways of the western states have proved the most profitable and productive of any in the world. With other facilities for transportation, they nearly equalised the prices of provisions throughout the mighty expanse of the republic, and enabled every district blessed with abundance to feed and enrich those that were pinched by scarcity. But with all these advantages, of which no country of even one quarter of the area possesses half the same facilities of transport, the general scarcity was everywhere keenly felt, and farmers clung to the precious remnants of their lean harvests, as men in beleagured cities hoard their scanty but invaluable supplies.

A few facts by way of illustration may be worth relating.

During this strange state of things—so unprecedented in this country of abundance, and while I had scarcely the heart to lift a pen about American affairs for the readers of *The Daily News*—I travelled several thousand miles through the great granary of "the Great West," and extended my tour into the most prosperous of the British provinces on our northern frontier. Everything was scarce and dear. Millions of farms had been literally stripped of all that could be spared to sustain the life of man or beast Wheat in the interior of Illinois, which for five years had averaged not more than 60 or 80 cents per bushel, was selling from the granaries for double and treble that amount. Indian corn had risen from 25 and 30 cents to 80 and 90, and everything in proportion. Neglected and secluded districts, where a speculator in breadstuffs had never been seen, were scoured by agents of provision-houses, like bands of locusts. While this sight was witnessed in the West, the Eastern, and particularly the New England States, being nearer the market, had long been stripped bare. In distant and mountainous regions, potatoes were sold for 1½ dollar a bushel, instead of 20 and 25 cents, their former standard price.

This picture was partial in no respect. The scarcity was general, the alarm was universal, and towards the close of winter a new interest began to be felt in agriculture. Little more was written or said about manufactures. Trade and commerce began to lose their charms. Men of substance began to turn away from the ephemeral enticements of stocks and speculations, to contemplate the more substantial interests of agriculture. England and France were engaged in a mighty war, but their granaries were full: we, in a period of unruffled peace, seemed to be visited by the usual curses that are engendered by hostilities, and we began, as in 1837, to look abroad to see where we could purchase bread.

Thus, when the spring opened, and at a much earlier period than usual, the entire agricultural force of the country—men, cattle, manure, seeds, and soil—were brought into requisition, and almost every acre that could be tilled was laid under tribute. With the scarcity of the previous year still unrelieved, all who had suffered determined to look out for the future; while those who had raised anything to sell had their cupidity inflamed by the hope of corresponding profits for their approaching labours. Planting was far more extensive throughout every section of the country than had ever been known before.

There are certain crops in the United States, which, being ranked among the staples of the country, are sure, under any circumstances, never to be neglected, while they seem regularly to increase in their products with the ratio of the growth of the population and the increasing enterprise and demands of the world. Among these are cotton, tobacco, wheat, Indian corn, sugar, &c.

Cotton, although by no means so extensive or intrinsically valuable a crop as Indian corn, is our national staple, since it furnishes a larger surplus for exportation than any or all other crops. The cotton-growing states had of late years pressed its cultivation almost to the exclusion of Indian corn, of which they received their chief supplies from north-western states, where a peculiar adaptability of soil, climate, and labour favoured its production. But last year the planters of the south, with three millions of slaves to feed—sustained chiefly on bacon and Indian corn—were nearly impoverished by their heavy outlays for these western productions, which cost them about double their former prices. Early in the spring it became evident that southern planters were preparing to return to their old system of raising at least a considerable proportion of their staple breadstuff. Learning how general this determination had become, the impression at once went abroad, and was industriously circulated by cotton speculators on both sides of the Atlantic, that the cotton crop would this year fall far short of the common average in consequence of planters turning their attention more than formerly to other fields of agriculture. But the result has shown that a more serious misapprehension could hardly have existed; for although nothing nearer than an approximate estimate can yet be made of this year's cotton crop, yet it is true beyond all question that more acres were planted with cotton last spring than had ever been planted before—that the crop has matured earlier than usual—that more bales of the new crop have reached the southern markets than in former corresponding periods—and finally, all sources of information or rational conjecture justify the belief that the cotton crop of this season will considerably exceed that of any previous year. No estimate worthy of much confidence has yet rated the crop below 3¼ millions of bales. At the same time, the Indian corn crop, which is all gathered, is known in the southern, and particularly in the cotton-growing states, greatly to exeeed the product of any former season.

The ordinary wheat crop of the United States is estimated at one hundred million bushels. Last year it fell considerably below this figure. But it is satisfactorily ascertained that this year's crop rises far above 100,000,000. The most probable estimate is 140 or 150 millions; our own consumption requires about 100 millions—but in abundant years we average somewhat over 3 bushels per head—which, with a crop of 100 millions, and a population of 25 millions, would leave us from 15 to 20 millions for export. Now, reckoning our population at 27 millions, and our crop at 140 millions, and allowing 3½ bushels per head for home consumption, we shall have this year nearly 50 millions of bushels for foreign countries.

With such a basis for calculation, you may ask why wheat still bears such high prices in our markets. It can readily be accounted for. 1. Large dealers early made contracts for fall demands at prices which, although somewhat less than those of last spring, were high—and control the fall markets to effect their own sales. 2. The belief that the prospect of peace in Europe is so distant, tends to keep up prices; and with the anticipation of large orders from abroad, holders and contractors have been all the fall operating for sustained, if not augmented prices. 3. The realisation of their anticipations in

the large orders recently received from France, has either raised the prices of all our breadstuffs, or held them steady. 4. The ascertained fact of the shortness of the English and French harvest has also contributed in no small degree to keep up the price of corn in our market; and, finally, the high prices of last year having inflamed agricultural cupidity, farmers hold on to all the crops which they can keep in good condition, preferring the hazard of a fall rather than not realise the prices of twelve months ago. But it is clearly understood that these prices can be sustained only for a little time, in consequence of the causes above cited. Nothing can now keep up the present rates of corn in our markets except an unprecedented demand from Europe. If England and France call for all our surplus we shall find higher qrices still in the middle of winter, and these prices may in that case be considerably augmented by the early closing of our canals. The usual period for closing the New York canals is from the 10th to the 25th of November. They are not shut regularly on any specific day. Boats ply until they are frozen in, as thousands are every year. If severe weather should shut our canals by the 1st, or early part of November, the freight frozen in would come to market loaded with increased expenses, and thus tend to keep up prices.

But any or all of these circumstances combined can hardly make this a year of dear bread, as we shall see from other causes yet to be considered.

Indian corn is the largest and most valuable crop raised in America. It is the chief ingredient that enters into the consumption of at least half our population, the fattening of hogs and cattle all over the country, and the sustenance of horses and many other aaimals. Our estimated crop of Indian Corn is from 500 to 600 million bushels. The States of Tennessee, Kentucky, Ohio, Indiana, Illinois, and Missouri each raise 50 millions and upwards of bush. per annum. The Indian corn crop last year was short, and corn averaged one dollar a bush. throughout 31 states. An unparalleled crop has, however, been harvested this season. In very reliable quarters the crop is estimated at 800 million bushels—some go as high as 1,000. But I cannot believe it will prove less than 800. It will be more likely to exceed than to fall short of that amount, stupendous as it may seem. Foreigners can hardly comprehend the immense importance to us of this crop. It is to America what potatoes are to Ireland. When Indian corn is plentiful, other breadstuffs and provisions must come down.

Our oat harvest is always looked forward to with interest for there are six million horses to feed, of which the greater portion are for farm work, and require good feeding; for them chiefly the oat crop is used. Our common yield is about 140 million bushels. Last year it could hardly have exceeded 100. This season has seen the greatest oat yield we have ever had; it can hardly fall short of 200 millions—it may exceed it. In proof; oats fell in four weeks in all our great markets from, one dollar to 40 cents per bush. Of this grain it is calculated that for a crop of 145 millions, New York raises 28 millions, Pennsylvania 22, Virginia 10, Ohio 14, and Illinois 11 million bushels. This crop sustains the Indian corn perceptibly—for in the absence of oats we have to fall back on corn, which is rarely used for horse feed when oats can be obtained.

Rye is one of our important crops, especially in the northern and eastern states, the common yield being 15 million bushels. More than half of it is raised in the three states of New York, New Jersey, and Pennsylvania—the latter state contributing fully one-third of the total crop. Rye is extensively used for bread, as a substitute for wheat, although it is doubtless true that more than one-half of all the rye produced in this country is converted into spirits.

Rice is also a valuable crop. The yearly produce exceeds 200 million pounds, which would give 8 pounds to every inhabitant. Of this growth three-quarters is the growth of South Carolina, and the balance comes chiefly from Georgia. The yield this year is above the average, and will probably reach 240 million pounds.

Potatoes (Irish) are a crop of immense value. They are raised in every state and territory in the Union. The common yield is 65 million bushels. For several years the rot has hurt the crop, and tended to diminish the cultivation. But this year the potato harvest is altogether without precedent. The common estimate of the season's yield is upwards of 100 millions. while many careful calculators raise it to 150.

Sweet potatoes, which are raised and consumed chiefly in the south, general yield 35 million bushels. This year the crop will, it is generally thought, reach 50,000,000. They are a delicious substitute for bread and many other articles of food, and in their absence are called into requisition.

Buckwheat, when the harvest is plentiful, greatly mitigates the scarcity in other grains. It is valuable as breadstuff, being used by all classes for a hastily prepared griddle cake for breakfast, and also for provender for all sorts of animals. More than half the whole crop is grown in New York and Pennsylvania, although it is raised in all the states and territories with nearly universal success. It is generally sown as a second crop in the latter part of July or early in August. The ordinary crop is 10,000,000 bushels, which must have been greatly exceeded during this year, which has been so favourable to this grain, that it fell in a few days from 1 dol. 50c. to one-third of that price per bushel.

The hay crop of England is worth more than all her foreign commerce—ours is correspondingly valuable. The annual product is estimated at 14,000,000 tons. It has been a particularly wet summer, and grass and the finer of all grains and herbs and plants have been unusually luxuriant. Hay is everywhere abundant and cheap. Rye, oats, and wheat straw, the stalk of Indian corn, and other articles, which, when abundant, do so much towards fatting cattle and carrying them in good condition through our inclement winters, are gathered in larger quantities than ever before. The feed of the meadows has been fine all through the season, and the product of the American dairy has exceeded the general expectation. Instead of 300,000,000 pounds of butter and 110,000,000 cheese, it would be safe to reckon an increase of 15 or 20, and in many states 30 per cent. over common seasons; while the dairy of last year, which was one of drought, is nearly or quite doubled in 1855. New York, Pennsylvania, and Ohio are the great grazing states, the average of their joint product for the last five years being 150 million pounds of butter and 80 millions of cheese. Not less than 10 million bushels of beans and peas, exclusive of the produce of gardens, are regularly calculated on, while the yield this year of pumpkins, squashes, turnips, and carrots is surprisingly large.

Nearly all the county and state and national fairs have been held, and the concurrent reports from all quarters represent the exhibitions of the products of agriculture as far superior in quantity as well as quality to those generally exhibited on former occasions. Unprecedented numbers of contributors and visitors have attended these fairs. At several of the county fairs which I have attended the average number of visitors has exceeded 10,000. As a general rule, all the expenses incurred in preparations for these fairs (which in state and national fairs often amount to from 10,000 to 25,000 dols.) as well as the liberal premiums and prizes allotted, are met by an admittance fee of from 10 to 25 cents. Gentlemen who volunteer to serve as committee of arrangement publish a list

of the premiums several weeks beforehand, relying with confidence on the receipts. These fairs are growing more popular every year, and they have been more numerous, better attended, and have offered far better attractions than at any former season. These fairs have this autumn been numbered by hundreds, and the aggregate of their premiums and prizes must have reached several million dollars.

Such is briefly the result of my observations, reading, and correspondence on this momentous subject. I put forth the foregoing statements, figures, and estimates with some degree of confidence, nor can I believe that they will in any important respects be found to vary widely from the truth. Such a harvest as we have witnessed this year America has never seen before, and it must require the strangest combination of unforeseen circumstances to keep up former high prices for breadstuffs and the necessaries of life. Our abundance can easily make up the deficiency in the harvest of Western Europe. But it is to be hoped that in any future order which may be sent from Europe, more discretion and judgment will be displayed than there was in the late orders from the French government. They were required to be filled instantly, and speculators, taking advantage of the fact, struck for high prices, and France paid from 15 to 20 per cent. more for her corn ordered than was necessary. She paid at the rate ten dollars for 200lbs. of flour, when the very same week 800 of the mechanics of Massachusetts clubbed together, and sent an agent to the west, who returned within four or five days with 1,000 barrels of better flour at a cost (and by railway transportation) of only a trifle more than one-half the French government paid. As a rule, European orders filled in New York cost from 15 to 30 per cent. more than they would if foreign agents would go at once to the western granaries with gold in their hands.

THE POSITION AND PROSPECTS OF IRELAND.

The social condition of the Irish people depend more on the physical position of the country than on its political state; an increase in our wealth, if that wealth be diffusive, will be a cure for many of the evils that are ignorantly sought to be removed by political nostrums, put forward by mere mountebanks to delude the ignorant; and although the mile-posts along the road do not diminish the distance, yet they indicate the progress we have made, and if we endeavour to discover and indicate our present position we may render essential service to a large number of our fellow countrymen; and when we consider that agriculture is the employment of so large a portion of the people of three provinces in Ireland, and that the wealth that is derived from the soil is the sole means of support of numbers who may think themselves not at all connected with the cultivation of land, we hope the topic will not be without its interest.

Adam Smith has, in his "Wealth of Nations," classed the sources of national wealth into three branches:—

That derived from the cultivation of the soil, or from the sea—

That which is drawn from the bowels of the earth—

And that which is added to the value of either mineral or vegetable products by manual labour.

We apprehend that fully three-fourths of the Irish people are dependent on the wealth that nature yields from the cultivation of the soil, and we doubt if one-fourth of our people derive their incomes from mines, manufactures, or fisheries. If, then, we take the agricultural returns which have just been published by Mr. Donelly, as indexes to show our position, and use them to indicate the prospect before us, we shall be performing a service to our country; and although these tables may appear masses of figures, to us they indicate social advancement and mental progress. Her improvement of agriculture, which will make the same extent of land support more human or animal life, is an achievement of vast importance; and as the same cause that acts on one individual acts on masses, so the spirit of improvement gradually spreads in continually extending circles. The prosperity of the farmer, which arises from abundant crops, is felt by the merchant at his desk, by the lawyer in his library, by the man of science in his laboratory, by the shopkeeper in his warehouse, by the tradesman at his bench, by the seaman on the ocean, and by the labourer at his home; we purpose to glance at the past, the present, and the future, to examine the different results and position of tillage and stock-feeding, to investigate the burthens upon land, and to seek to estimate the quantity of food which, beyond our own requirements, may be spared to exchange with the world for the luxuries which these climes can afford.

Trade is a system of barter—the price of the grain, the meat, and the butter—which we give to feed the Manchester cotton spinner or the Birmingham smith, compensates for the cloth or hardware we require, or the articles of manufacture, created by the food we supply to these workmen, go to China to exchange for tea, to the West Indies to compensate for sugar. The wealth of Ireland is our surplus food—what we can spare after feeding ourselves, and if with a smaller number of mouths to fill we are able to export a larger quantity of provisions, it is evident we are increasing in wealth; if with our diminished population we have a reduced export, then we are standing still; and if our exports have lessened more in proportion than our population, then we are retrograding.

Some writers have assured us that the operation of the Incumbered Estates Court has *per se* tended to improve our condition, and that the sale of land to the extent of upwards of nine million sterling has greatly benefited Ireland. The sales of land in the four provinces has been:—

Leinster	£2,768,210
Munster	3,270,287
Connaught	2,173,202
Ulster	2,218,762
	9,430,461

But it should be borne in mind, that the money so invested went to pay some one who had in turn to reinvest it; and that thus the creditor who was paid off to-day became the purchaser of to-morrow. The national wealth has not thereby been increased; but if the new possessor has made the land more productive than the old, if thereby the acreable produce is increased, then our wealth is augmented.

The basis of all wealth, whether from agriculture, from manufacture, from mines, or from fisheries, depends upon labour. We seek to economise human labour by using the horse, or the steam-engine to multiply the products of man's labour; and we find that in Ireland a great change has taken place in the quantity and in the value of human labour. Man is more valuable, and therefore agricultural implements and machines, which substitute the horse and the steam-engine, have within a few years been more extensively used. The late Sir Robert Peel, many years ago, said that there were five labourers in Ireland to do the work of three, and that this was

one of the causes of its condition; but a vast change has taken place in the labour, in consequence of

EMIGRATION.

The census returns show that the reduction in the population between 1841 and 1851 was 1,659,330 persons. The proportion of adult males would, under ordinary circumstances, be about one-fifth, or 331,866 persons. Those who know the character of emigrations, and that the very young and the very old have remained at home, will not consider we overrate its effects, if we assume that in this interval at least 500,000 of our labouring male population have been exported or transported. This drain did not, however, cease with 1851; the flow of emigration continues, and the number of Irish emigrants, since that time, is stated to have been

In 1851	254,537
1852	224,997
1853	199,392
1854	193,426
Making a total of	872,352

Of these about 300,000 may be considered to be male labourers —so that since 1841, or speaking more properly, since 1846, Ireland has lost about 800,000 of her male labourers; these form nearly one-half of the adult males who were in Ireland in 1846: assuming this class to be one-fifth of the entire population, and that it was in 1846 8,500,000, the male adults would form 1,700,000. We calculate that 800,000 have been expatriated, and then the number of labourers would be reduced below Sir Robt. Peel's estimate; notwithstanding this diminution in our labourers, it is remarked that the land is better tilled, and that the aspect of the country is greatly improved, so that to the casual observer it would seem that we have gained sensibly by the change; and while we do not deny that the country has gained by the removal of so large a portion of a mass of half employed labourers, and see that the labour market has felt the relief thus given by a diminution of the supply, and that an advance has taken place in the wages of the labourer, we find that we must glance a little deeper to estimate the results; and it appears that during the period when we had the redundant population our exports of corn were much greater than they have been of late, thus the diminution of manual labour has been attended with a reduction in the products of that labour. That decrease has been about 2,500,000 souls, and merely for their support between 500,000 and 600,000 acres of land would annually have been required, or, speaking of grain, there would have been one quarter of corn of 480 lbs. consumed, on an average, by each person. In other words, had our population continued as great as it was in 1846, they would have required annually about 2,500,000 quarters of grain, or some other food that would equally occupy the land; but, strange to say, the decline in the consuming power from the removal of that number of mouths has not increased our exports, notwithstanding that we have, on average, for the past five years, been importing Indian Corn more than equal to the wants of a million and a-half of people. The imports of Indian Corn have been as under, and allowing one quarter for each person's consumption, it amounts to nearly what we have said:—

IMPORTS OF INDIAN CORN:	Qrs.
1850	1,286,263
1851	18,21,513
1852	1,479,890
1853	1,554,434
1854	1,356,379
Total	7,491,539

The money value of this Indian Corn will probably be from two and a-half to three millions sterling per annum, and as we must have given some of our produce in exchange for it, our exports ought to have increased in the same ratio. We shall not be accused of partiality when we contrast the two periods of five years from 1840 to 1844, and from 1850 to 1854. During the former five years (from 1840 to 1844) the exports of grain were 12,449,107 qrs.; while from 1850 to 1854, they were 7,226,051 qrs., being a diminution of 5,223,056 qrs., which, on an average, is 1,000,000 of quarters annually, or the produce of 350,000 acres of land. We have said our expatriated population would have required the produce of between 500,000 and 600,000 acres for their sustenance; and although our imports of Indian Corn are about equivalent to the produce of 400,000 acres of land, yet there has been a diminution in our tillage of 900,000 acres of land,—Waterford Mail.

THE AGRICULTURAL LABOURER:

HIS CONDITION AND CLAIMS, AS NOW CONSIDERED AT OUR AGRICULTURAL GATHERINGS.

It was in very high fashion, only some two or three years since, to attack our agricultural associations on one especial feature, which was too often found to attend their proceedings. They would not confine themselves within the range of mere landlord and tenant. They were not content with offering premiums only for the best cattle, or the best farms; or with giving "one cheer more" for a good sample of a country gentleman. Strange to say, they would bring the labourer in. They would have it that he ought to have some interest in these anniversaries; and that if he too had at all distinguished himself, that he too should be honoured accordingly. They seemed to feel, in a word, that it must be not only their duty, but to their advantage to show that they could appreciate the conduct of a good servant. On this they were bold enough to act. They called him up, and they said, corum populo, "John Bunchclod, you have been a good servant; you have been for so many years on neighbour So-and-so's farm, a fact that speaks well, to the credit of both of you; you have brought up your family in a respectable manner; you have proved yourself not only a good workman, but a good man, and we wish to offer you some slight mark of that esteem your character has earned for you."

Curious as it may appear, this was all wrong.

There was no ridicule too strong, no abuse too great for any Society which had dared to move in this direction. The absurdity was too manifest. The idea was altogether preposterous, to give a man two or three pounds for twenty or thirty years' service, or to encourage him to rear his children without bringing on them the stain of parish relief. It was manifestly too selfish a proceeding. To be sure there was something like a precedent to go by. The soldier might have his medal, the citizen the testimonial of his fellows, or the scholar even his purse of gold. With the agricultural labourer, however, such a course could do no good. Nobody ever knew exactly why; but it could not, and that was enough. The able-bodied workman did not want your two or three guineas, or your testimonial, or your approval. At least he was incited not to want nor to claim them. He *was* able-bodied and independent so far; and when he was not, he might go on the parish. But, until then, "let him take castles who has ne'er a groat."

Stranger still has been the effect of all this ridicule and opprobrium. There is scarcely now a local society in the kingdom but gives the labourer a share in its proceedings. There is not one but which speaks to the mutual good accomplished by these means, and the yet further benefit to be achieved by such agency. The labourer himself has been amongst the first to feel this; for it is very certain that if he had slighted, as he was told to slight, such efforts on his behalf, we should not have these series of rewards, extending as they now are in all directions. The drunkard, the idler, and the malcontent, who caught greedily at the sneer, and echoed it throughout the land, are day by day becoming more and more in a minority. Time has proved there is no harm in publicly distinguishing, in the presence of his fellows and his employers, the merits of a good and faithful servant. All interested speak alike to this. The experiment is already "twice blest—it blesseth him that taketh, and him that giveth." The bishop of the diocese, "the noble lord in the chair," the parson of the parish, the farmer at the Grange, and the poor man in his cottage, are for once unanimous. This feature in our agricultural associations, to use a homely phrase, is doing "a power of good." The force of ridicule, strong and dangerous a weapon as it is, for this time has failed. That which it would have laughed out of court, has only come the more into use and approval. An Englishman, after all, despite the ease with which he is often led, will stay sometimes to think for himself. He did not stay here, but he proceeded calmly on in his own path; while we are egotists enough to add, that we thought, as we have said from the first—he was right.

We subjoin evidence. The bishop, the noble lord, the clergyman, and the farmer, are all here; and all, as we take it, with something well worthy of the attention of our readers. It is not, however, to what these societies have done, but to what they may yet do, that we would ask consideration. In almost every extract we have arranged there will be found some point which, if only further developed, will still further improve the condition of the agricultural labourer. It is the presence of the men on these occasions that suggests these topics. It will be their continual attendance hereafter that will keep such themes alive, and tend chiefly to their being carried out. The good workman, whom you reward for his ability and industry, should have a decent home to go to after he leaves your table. Has he such a one? is a question that will very naturally arise. When you commend him for keeping his family from the parish, might you not take advantage of the occasion and incite him to educate them? When you present him with the premium for the best workmanship, do you not feel that he should be allowed to take that work to the best market? It is then the question becomes personal to us all—what the landowner may do on his estate, or in "the House;" what the parson in his parish, and the tenant on his farm.

We return to this subject because, we are glad to say, it is again and again, week after week, now being brought before us. It has been this season one of the leading topics at our agricultural meetings; and it is as a matter especially appropriate to such occasions that we continue to dwell on it; for, as Mr. Williams said, at Abingdon, the other day, to his brother farmers, "the more they improved the standard of their servants, the more they would improve their balance-sheets, and put money in their pockets."

His Lordship recommended them to the observance of propriety in the growth of cottagers' productions, observing that amid the useful they should not lose sight of the refining influences of the ornamental, and that the proper place for the rearing of vegetables was the vineyard, while the plot around the cottages should be appropriated to flowers. He proceeded to enumerate some of the advantages of an allotment; among others, its affording a pleasing pursuit after the labours of the day, the delight which the cultivation of vegetables was sure to bring, and the result of the attachment to his allotment which the cottager generally felt, drawing him away, as it did, from injurious pursuits and immoral recreation, and giving him a stake in the country. A well-kept allotment was the index to the habits and tastes of its owner. The same feelings which prompted him to keep it clean and free from weeds would operate upon his domestic tastes; he would like also to see his cottage clean and cheerful, his children orderly and happy, and his pig, if he kept one, well looked after. He also treated his children, in a moral sense, on the same principles as he did his garden, knowing that if not trained to morality their minds

would be choked with noxious weeds. He took care that they attended regularly at school and church, and that he never went himself to the beerhouse. The beerhouse was the bane of England. It was that which filled our workhouses and gaols, and brought to ruin those who haunted it. Even, to make the best of the beerhouse haunter, he was a cruelly selfish being, for he spent in his own indulgence the means which ought to go to the support of his own family; and, not content with this, he too often reeled home to maltreat the wife whom he had so solemnly sworn to protect, and the children so prone in after-life to follow his pernicious example. Some remarks had been made in the report upon the important subject of education. He, for one, was inclined to carry it out much further than by many was thought either necessary or prudent. The time was coming when machinery would be employed in agriculture to a much greater extent than now, and when, therefore, the labourers who worked it must obviously be intelligent and skilful. But what sort of preparation for such labour were the children of labourers but too generally undergoing? Why, while still a child, having learnt hardly anything whatever, a boy was generally taken from school just at the time when he might begin to profit by it, and put to keep birds from the corn. Some few years ago he had a friend, a clergyman in Hampshire, who was an enthusiast in education, and who made up his mind that he would do what he could to carry out his views. Accordingly, he built commodious school-rooms, engaged the best masters, and induced both the farmers and the labourers to send him their sons, and to allow them to remain at school a much longer period than usual. He adapted his education to the wants of each class so as to fit them for the relative positions which they would be called upon to fill—instructing the farmer's sons not only in the elementary subjects which were taught in common to both classes, but also, among other sciences, the important science of agricultural chemistry. In a few years he was surrounded by an intellectual population. But his object had not been effected without opposition. One farmer was particularly annoyed when he found it becoming more difficult and more expensive than formerly to get the birds frightened. But the Government, appreciating that clergyman's exertions, had rewarded him with the deanery of Hereford, and at a public meeting the other day he had had his health proposed by the very farmer who had formerly found so much fault with him, and who frankly admitted that he had seen his error, and that if it had cost him more to get his labour done he was amply repaid by the superior manner in which it was performed.—The BISHOP of BATH and WELLS, at Crewkerne.

The object of this institution is to show honour to good conduct. It is not the pecuniary reward—it is the acknowledgment publicly given to an individual that he, in his station of life, has conducted himself with thorough respectability, and deserves the respect and honour of those by whom he is surrounded. That is what we tell them. We give them a card which shows this, and any one who goes into their cottages can see that this is our opinion of them. Why, you hear of soldiers fighting formerly for a shilling, and now for eighteenpence a day. They are not fighting for that alone. It is not that which induces them to risk their lives for their country. It is the hope of honour—the reward they expect for distinguished conduct in the field under the fire of the enemy—that is their reward. The medal which they receive is not worth half-a-crown. Do they ever attach a money value to it? It is the honour of the thing that they regard, and it is that honour which leads them to distinguish themselves in the presence of the enemy, to obtain glory for themselves and their country, and the advancement of public interests. And as far as we can, in our humble way as agriculturists, we endeavour to promote the same feeling among labourers, by giving them the highest mark we can bestow of our respect and consideration. For myself it is the greatest pleasure to see these most respectable persons approach this table, and receive that which we can bestow; and I know it is to the employers a subject of the greatest gratification to be enabled to produce them at this table, and show how well they have been served. I am delighted to see the union between master and servant which is exhibited when these men come forward to receive their prizes. I know the master takes as much pleasure in it as the person who receives the prizes.—Lord ELLENBOROUGH, at Winchcomb.

He considered it the duty of those who had the power to devote more time and money to this subject than they had hitherto done. For himself, although he had not done very much, yet he considered it to be one of the chief duties he had in this life to perform to endeavour to improve the dwellings of the poor. There were vast numbers of cottages on his father's estate, many of which he confessed were in a state very different from what he would like to see them. But there was great difficulty in dealing with this subject. They tried as far as they could to promote the improvement of the poor in this particular. A positive order had been given on the estate, on no account for any cottage to be built in which there were not three sleeping rooms—one for the parents, one for the boys, and another for the girls. Such an arrangement had not prevailed in this neighbourhood nor in any other part of England. Even in the case of a young couple being put into a cottage, there should be three rooms; for though the family at first might be small, the necessity might arise as it became larger, and as the children grew up. No one could be more alive to the importance of the subject than he was. But he could not help adding that it did not on all occasions depend on the landlord, for it would sometimes unfortunately happen that, if they did not keep a sharp look-out, after putting a couple with a small family into a cottage with two or three rooms, they would let off one of the rooms to a lodger. One could not deny that they were poor people, and that such a help towards paying the rent might be very acceptable; but it showed that the fault was not always the landlord's, but that the cottager sometimes frustrated the good intention of the landlord by his own act.—Lord BRUCE, at Marborough.

They had heard a great deal about the improvement of cottages, model cottages, and so forth; but he should be obliged to any one who would tell him how to build a cottage and make it profitable. It was said, look at the Scotch, and see what they have done in this respect. Why, throughout Scotland there were but two rooms in any of their cottages, which, in their own language, they called "a but and a ben;" and no matter how many children there were, they were stowed, just like herrings in a barrel, altogether in the same bed. He must say, however, notwithstanding, that the Scotch peasantry, on the whole, were more moral than those of England. He would tell them more than that. He had endeavoured continually to turn small families out of large cottages, and to put large families into them. But what was the consequence? Why, they shut all the children into one room, and let the other. If this association would tell them how to keep people separate who ought to be kept separate, he for one would be much obliged to them. — Mr. H. DRUMMOND, M.P., at Chertsey.

There was a subject of great importance—the improvement of labourers' cottages, so as to obviate the present over-crowding. He acknowledged, however, that there were great diffi-

culties in the way; one of the chief of which was the propensity of the labourers, when they got decent accommodation, to take lodgers, and thus reduce themselves to their former condition. The tenant-farmers were as anxious as any class of men could be to benefit the labourers; but there really seemed to be no remedy for the indiscriminate packing together of the sexes in humble life, but by endeavouring to influence their moral feelings on the subject.—The Rev. J. Cox, at Witham.

He agreed in what had been said of the great utility of these societies to the labourers. The improvement of their cottages was a most important question, and he thought they must lay great blame on the present state of the law; for if the area of settlement was enlarged, the temptation of landed proprietors to get rid of cottages on their estates in order to force the labouring population into an adjoining parish would be done away with. If such an alteration were made, he believed the result would be extremely beneficial.—Mr. Mechi, at Witham.

Two topics had of late attracted public attention; namely, the early age at which the children of the poor were taken from school, and the reformation of what were termed the harvest-homes. With regard to the first, when boys were trained up to work, in order to augment the earnings of the parent, he did not know that much fault could be found. The great evil was that they were generally occupied on Sunday from one year's end to another. He suggested whether employers could not give each alternate Sunday to the farm servants, in order that they might attend church and Sunday schools, and not continue to be withdrawn from the moral and spiritual influence of the sabbath. They all, of course, wished to raise up a class of moral, industrious, and self-dependent peasantry; but if the children of the labourer were taken from school at the most impressible period of their lives, they could not hope to effect that object. With reference to the efforts which had been made in Norfolk to substitute for the usual scenes of drunkenness witnessed at present at harvest-homes a general holiday, in which the wives and families of the labouring classes might participate, they would have every encouragement from the clergy. He knew farmers were very liberal on getting in the harvest, and he had no doubt they would co-operate in their various districts to have a general merry-meeting of the character to which he had alluded, rather than that the present scenes of drunkenness, with their frightful consequences, should continue.—The Rev. J Bramston, at Witham.

I see farmers are rewarded for having sheep, and cows, and pigs in good condition. I should like to see a prize offered to the farmer who would have his labouring men in the best condition. When our young men by hundreds joined the militia at Hertford, it was publicly remarked that they were low in flesh but high in bone. They must have come from hard work, or no work and low food, or not such as men require in this climate. Their uniform hung loosely on them; but in a month's time, by the care of their noble master, the colonel, seeing they had a regular supply of animal food, they filled out to their red coats; and when they came home on a Sunday to visit their friends, they were astonished at their improvement in condition. I say, then, we want some means of putting our labouring men, as well as our cattle and sheep, in better condition. They must be well fed, as well as the cattle and sheep. It behoves landlords and farmers to look to this, for wages must rise with the cost of provisions. If this were the case, the poor man would not be compelled to take his little boy away from school at eight or nine years of age to go to work for food, but he would be able to keep him at school till twelve or thirteen; and then I should have candidates for my prize, No. 45, which our chairman so kindly noticed, but which this day is to be marked "no competition." What we require is, I believe, a more extended sphere of encouragement in this direction, and in other branches that would directly or indirectly tend to improve the moral and physical condition of the labourer. For instance, let there be a prize also for the farmer who would supply the best home-brewed beer for his men. Let the master take steps for the men having good beef, and mutton, and pork, as well as bread. Depend upon it, it will pay well: the men will be twice as strong, and much more proof against disease. Let them take the trouble to provide "change" for the payment of every man's weekly wages, and not force him to go for it to the public house. Let the men have half-holidays on Saturdays. "All work and no play makes Jack a dull boy." Let every village have its playground for cricket and other manly games; let prizes be given for prowess in these, and for the produce of poor men's gardens; and let prizes be given to the best reapers as well as best ploughers. I often see fifteen or twenty men of my parish out of work; for the fact is, in Ardeley there are, even after all the drain of the war and the militia, about twenty men more than the land requires; and yet, by the absurdities of our poor-law, they are tied down to the parish, and dare not go beyond the neighbourhood for employment. I say these restrictions are a clog to the labourer, and inconsistent with these days of locomotion. We have free trade in corn, and we want free trade in labour. Let the labourer, when in distress, be relieved, wherever he is.—The Rev. W. W. Malet, at Buntingford.

It was the great privilege of the clergy to mingle amongst persons of all ranks; and it was surely a great privilege for them to join in meetings similar to the present. He regretted more of his brethren were not present to witness the manner in which the landed proprietors, and the employers of labour resident in the district, rewarded, not with money, but with their approbation, those who have been working for them for a long period faithfully and successfully in the pursuits of agriculture. So long as that feeling was carried on—so long as the British farmer interested himself in the welfare of the labourer, and the labourer was made to understand his contract with his employer, and was called upon to fulfil his engagements, so long would agriculture thrive and prosper. They must remember that at the present time there was a great dearth of agricultural labour existing in the land. The working man was worthy of his hire; and there was an urgent and imperative necessity, not only that the labourer should be brought to understand his position, be made certain of his reward, and know that what was justly due to him from the farmer should be fully paid—not only that the farmer should get what he could from his thews and sinews, but also cultivate the powers and faculties of his mind. By rewarding the labourer as they had done that day, they were really interesting him in the cultivation of the soil.—The Rev. Mr. Witts, at Stow-on-the-Wold.

His Grace the Duke of Rutland had shown himself most anxious to support every plan which had for its object the improvement of the moral and social habits of farm labourers. One means by which the noble Duke had sought to benefit them had been by granting them small allotments which they might cultivate themselves, and which, by giving them a greater interest in the labour of their hands, might stimulate them to industrious habits. He was sorry, however, to observe that many of those allotments were far from well cultivated; and he threw it out as a suggestion whether, if prizes were offered by the Waltham Agricultural Association, it might not have a beneficial effect upon the labourers themselves. The most important question, however, which affected the future

improvement and happiness of the labouring classes, was the question of education. He had most anxiously watched the progress of farm labourers in education, and he grieved to say that at the present time such was the difficulty in getting the labourers' children to attend school, and in keeping them there when they did attend, that education was almost, if not quite, at a standstill among that large class of the community. The question, too, was rendered still more difficult by the fact that this laxity of attendance was occasioned principally by the present increased demand for agricultural labour; and no prospective permanent benefits which they could hold out to the labourer for his children were strong enough to induce him to forego, even if he was in a situation to do so, the present advantages which he derived from their labour. However much it was to be regretted, it was quite certain that ignorance existed to a frightful extent among the labouring population in many localities.—The Rev. Mr. GILLETT, at Waltham.

The great object was to cherish and encourage in the labouring man those good qualities which could adorn his character as well as that of the high and noble of the land. There were two great evils which stood in the way of this, and which the clergy found pressing upon them while working in their parishes. These were drunkenness, and the bad accommodation afforded in the cottages of the labouring classes. With regard to drunkenness, it was only lately that he was reading the opinions of the Judges upon the connexion between drunkenness and crime. Mr. Justice Wightman said that four-fifths of the crime in the country arose from drunkenness; and Mr. Justice Coleridge said that in *every* case he believed the offence might be traced either directly or indirectly to the same source. The Judges seemed to have left out of sight the other great evil of which he was speaking—the want of decent cottage accommodation. With regard to drunkenness, much might be done by those who employed labour. If the face of an employer was set against drunkenness, and he would have no one addicted to that vice in his employ, it would be astonishing what a support it would be to the clergy. Because that man would feel a temporal punishment in the loss of his situation, which would do more to bring him to his senses than the loss of his good name. Many such men were lost to good advice and to all sense of shame, and the only way to make them feel was by touching their pockets. There ought to be some such arrangement as this, by which the drunkard should be a marked man, who could not obtain employment as others did. With regard to the cottages of the poor, much had, he knew, been done for their improvement throughout the country; but much still remained to be done.—The Rev. Mr. DOWDING, at Marlborough.

He thought that societies of this description were extremely advantageous, not only to themselves, but to the class of agricultural labourers. Some allusions had been made to the ignorance which at present existed among that class of the community. One thing was certain, that at present the farmers required the services of children almost as much as they did of adults, but he thought that the introduction of a system of evening schools in the agricultural districts would prove most beneficial.—Mr. CHOWLER, at Waltham.

In going round his own farm he saw young men who before knew little, and cared less, about implements and good cultivation, now taking a deep interest in both; for when they saw six sovereigns and two half-sovereigns won by his servants, by their skill and industry, it stimulated them to do their best, knowing that the same rewards were open to them. He (Mr. Williams) was fully convinced that in the same ratio as they (the farmers) encouraged their servants to improve their position in society, they benefited themselves. Society was so constituted that all depended on one another; and the more they improved the standard of their servants, the more they would improve their balance-sheets, and put money in their pockets.—Mr. WILLIAMS (of Northcourt), at Abingdon.

On the occasion when we last met in the autumn of last year, I had the good fortune here—through one of my labourers—to carry off the first prize in the turnwrest ploughing. He went home, but the news had reached the village before him, and the people of the place turned out and received him with shouts and cheers and songs that made the welkin ring. Now do you suppose this is forgotten? Do you suppose the reward of the moment is all the reward the man got? Not at all; these things dwell in their memory, and is not forgotten for the man's lifetime.—Mr. CLEASBY, in Surrey.

THE LONDON, OR CENTRAL FARMERS' CLUB.

THE BEST SYSTEM OF STALL-FEEDING CATTLE.

The first meeting for discussion, after the autumn recess, took place on Monday evening, Nov. 5, at the Club-house, Blackfriars, and was very fully attended. The chair was taken by Mr. B. P. Shearer; and among the gentlemen present were Mr. R. Baker, of Writtle; Mr. Owen Wallis, of Overstone; Mr. W. Bennett, of Cambridge; Mr. Thomas, of Lidlington; Mr. Grey, of Courteen, Northampton; Mr. Bradshaw, of Knole; Mr. Mechi; Mr. Moore, of Berks; Dr. Ellis, of Sudbrooke Park; Mr. H. Hall, and Mr. C. Hall, of Neasdon; Mr. J. Wood, of Sussex; Mr. Thomas, of Bletsoe; Mr. Howard, of Bedford; Mr. Little, of Chippenham; Mr. Owen, of Clapton; Mr. S. Skelton; Mr. Cressingham, of Croydon; Mr. Wood, of the Croydon Club; Mr. Bullock Webster; Mr. J. Parsons, of Brampton; Mr. Cheffins, Mr. Smithies, Mr. Passingham, of Herts; Mr. J. King, of Budon; Mr. W. Shaw, of Northampton; Mr. Chandler, of Wilts, &c.

The question for discussion, introduced by Mr. Owen Wallis, of Overstone Grange, Northampton, was stated in the following terms:—"The best system of stall-feeding cattle, particularly on farms chiefly arable, and where economy in the consumption of hay, or its entire omission in the process, is an important consideration."

The CHAIRMAN, in opening the proceedings, said, when in the month of January last it was the duty of the committee to decide upon the subjects which should be brought forward for discussion during the ensuing year at the Farmers' Club, they little dreamt of the extraor-

ordinary severity of the weather which immediately followed; nor had they any idea that the crop of turnips would be so light, or that there would scarcely be any hay at all this year. The question of feeding cattle "where economy in the consumption of hay, or its entire omission in the process, an important consideration," as it was, had, therefore, become of far greater consequence than was then supposed. From the able manner in which the gentleman on his right (Mr. Wallis) presided at the annual dinner in December, as well as what he knew of him personally, he had no doubt that the subject would in his hands be ably treated, and he would now call upon him to open the discussion.

Mr. WALLIS then proceeded, as follows: The subject for this evening's discussion is, as you are doubtless aware, "The best system of stall-feeding cattle, particularly on farms chiefly arable, and where economy in the consumption of hay, or its entire omission in the process, is an important consideration;" and I must claim your indulgence while I lay before you such evidence as I have been able to obtain on the subject, and also state my own views upon it. This I will do as briefly as I can; feeling assured that there are many gentlemen present who are anxious to favour you with their experience in the important matter of winter-feeding cattle, and whose opinions it is desirable we should hear. My attention was first directed to this subject by occasional visits in the spring of the year to the cattle market at Newcastle-on-Tyne, where I have been particularly pleased with the well-fed shorthorned and Scotch cattle that are there exhibited. They are brought chiefly from the counties of Durham and Northumberland; but some, I believe, come from the border counties of Scotland; and when I learned that nearly the whole of those animals had been brought to the state in which I saw them without the use of hay in the process of feeding them, and afterwards found that the same system was equally prevalent in Yorkshire, it occurred to me that it would not be altogether unprofitable for the London Farmers' Club to consider whether a method of winter-feeding cattle so universal and so successful north of the Humber, might not with equal advantage be more generally followed south of it. With a view of obtaining the best information in my power on the subject generally, I have taken the liberty of writing to gentlemen residing in different counties in England, simply stating the subject that was to be discussed by this club, and requesting them to favour me with the details of their own system of cattle-feeding, or with any other information they could give me that would assist in elucidating the subject. I also requested many of them to favour me with the names of any gentlemen they knew who were in good repute in their respective localities as stall-feeders, in order that I might also apply to them; and I take this opportunity of thanking those gentlemen for the readiness with which they have replied to my inquiries, and for the valuable information they have afforded me. That this is a subject of the greatest importance to the occupiers of arable farms, at all times and at all seasons, cannot for a moment be doubted; for they cannot successfully cultivate either corn or root crops without a sufficient supply of good manure, and for that supply they are, and I think will be, in a great degree dependent on the farmyard. However valuable the artificial manures may be—and their value cannot well be over-estimated—they can only be looked upon as most useful auxiliaries. But I think the subject is of more than usual importance at the present time, owing to the scarcity of hay, and more particularly to the scarcity of store beasts; for, notwithstanding the extreme rates at which meat has been selling, the occupation of the feeder has been anything but a profitable one during the present year, in consequence of the high prices he has been compelled to pay for his store cattle. Now, if our brethren in the north can produce annually a large number of well-fed cattle from their yards without the use of hay, why cannot we in the south do the same, and thus set at liberty an immense area of land now devoted to its growth, including, of course, that produced from the artificial grasses, on which young cattle may be reared and grazed till old enough for feeding? With a rapidly increasing population, demanding, and I am glad to say obtaining, a higher standard of living, it behoves the occupier of the soil seriously to consider how the increasing demand for animal food can best be met; and I can see no better plan than that of allowing straw to take the place of hay in winter feeding on arable and mixed farms to a much greater extent than it has hitherto done in the southern portion of England. I am not going to contend that straw is equal to hay for the purpose; but the question for our consideration is, does it pay to use it? or can we not, by an inexpensive addition to cut straw, make it equal to hay and straw when cut in equal quantities? or when straw is used uncut, make up by a trifling addition of artificial food for the difference between the feeding properties of hay and straw to the cattle? I think we can, and I am confirmed in that opinion by several correspondents, whose letters I will now read to you. I will begin with a letter from a gentleman who is well known probably to all of you. I allude to Mr. Ramsay. It is as follows:—

Derwent Villa, near Newcastle, Oct. 9, 1855.

DEAR SIR,—The system of feeding in this part is—most farmers breed their own short-horns, or buy them young. They are always well fed from being calves. They seldom eat hay, and not much cake; but there is more of the latter used lately: the price of butcher meat being high, enables the farmers to buy it. Cattle are mostly sold at three years old, and their fat is laid on by Swedish turnips, straw, and a little cake. The large farmers north of here grow very little hay; their pastures and grass seeds are mostly consumed by sheep eating them on the fields. Hay has been selling here the last winter at £7 per ton; and even if an ox eat a ton, it needs little argument to prove that won't pay. Many give bean and other meal to the fat cattle.—I am, dear Sir, yours truly,

G. H. RAMSAY.

The next letter is from Mr. Lister, and is as follows:—

Dunsabank, Richmond, Yorkshire, Oct. 11, 1855.

DEAR WALLIS,—The point upon which you wish to have

evidence is as to whether hay is a necessary or economical ingredient for feeding cattle. I do not think I am at all singular in esteeming it neither one nor the other. Mind I do not assert that hay does not assist in fattening cattle, but does it pay? Is there not a substitute that is cheaper? These, I think, are the questions which the Club has to consider. Straw here is not allowed to lie on the ground after cutting, but is at once set up in stooks or single sheaves: it is thus kept clean and sweet; and this straw stands in the place of hay. I use wheat, barley, or oat straw indiscriminately. My cattle get daily three feeds of Swede turnips, oilcake, and straw; or daily three feeds of Swede turnips, bean or pea meal, with 1 lb. of boiled linseed added, and straw.—Yours faithfully,

WILLIAM LISTER.

As Mr. Lister had not stated the quantities of turnips, cake, and meal he gave, I wrote to ascertain those particulars, and received the following answer:—

I do not cut my straw. The quantity of swedes given is from 90 to 100 lbs. They are always cut. 4 lbs. of cake is about the average quantity given.

The following is from Mr. Clark, of

Harbour House, near Plawsworth, Durham,
Oct. 26, 1855.

SIR,—In compliance with your request, I send you a statement of my experience and opinion on feeding cattle; but am afraid it will be of little service to you on the present occasion, as the cattle I feed will most probably be of a smaller description than the bullocks which are fed in your neighbourhood for Smithfield. The animals I feed are generally heifers of the Durham short-horned breed, two and a-half years old, and upwards, weighing when fat from 44 to 50 stones each, 14 lbs. per stone. I have not fed with oil-cake for three seasons, on account of its being so very expensive. I determined to make my cattle fat entirely on the produce of my farm, and have succeeded almost beyond my expectation. The cattle are placed in small folds (the latter part of October), well sheltered from winds, &c., two in each fold, sufficiently bedded with dry straw every day, so that they rest warm and comfortable. They are fed with white globe turnips and oat straw about six weeks; after that time with Swedish turnips and oat straw, until about four or six weeks from the finish I commence giving them half a bushel of barley and pea meal per week, with the turnips, increasing the quantity of meal a little each week. The cattle are fed four times each day with turnips, cut into slices three-fourths of an inch thick, always having straw to eat. The feeding troughs are cleaned out every day. The average quantity of turnips consumed per day by each animal is about 150 lbs. I cannot state the weight which each animal gathers per month, as I have no means of weighing them; but I generally have them about five months, and each animal makes from £5 to £6, according to circumstances, some seasons more and others less.

With regard to feeding with hay, I have no doubt that hay and turnips will feed quicker than straw and turnips. At the same time I should never think of growing hay for the purpose of feeding cattle. I prefer using it in a green state in summer, by which means it will make considerably more beef than when given in a dry state in winter, besides the great saving of expense. I always store my turnips, commencing in the latter part of November and finishing in December (weather permitting), so that the cattle never have any turnips given to them in a frosted or sanded state, either of which is very injurious. You will most probably think that my manure is deteriorated in value on account of my feeding without oilcake. This I admit; at the same time I have been very successful in producing large crops of the Swedish turnips, with the aid of Peruvian guano with fold-yard manure.—Yours respectfully,

MATTHEW T. CLARK.

The following is from Mr. Kay, of Darlington:—

Forcett Valley, Darlington, Oct. 23, 1855.

SIR,—I am in receipt of your letter requesting to know my method of feeding cattle during winter. I have great pleasure in stating it to you. Premising that my farm is principally arable, and the whole of it is adapted to the growth of turnips, I have nearly always a sufficient quantity of roots for the purpose of treading the straw down into well rotted manure, which is the end aimed at, as I consider turnips are merely a means to an end, and, making no profit, after taking into consideration the great expenses incurred in their growth, are therefore considered only in themselves a necessary evil.

My usual plan is to give the cattle as many sliced turnips as they can consume four times a day, with an unlimited supply of straw, commencing with the white turnips, then giving hybrids, and lastly swedes, giving whenever the turnips lose quality, either by frost or any other cause, a sufficient supply of barley or pea meal to keep them in a progressing state, but not with the idea of any profit to be derived from the cattle, or to the improvement of the manure, in both cases the return not being equal to the first cost, but merely for the purpose of retaining the beef already acquired. Cake I never use, as it is a well known fact that a great part of the cost has to be charged to the manure, which can, I think, be more economically improved or increased by the purchase of artificial manures, either phosphates or ammoniacal, whichever may be considered most adapted to the particular crop. Hay I do not make, on account of its interfering too much with the hoeing and cleaning of the turnip crop, without speaking on the question of profit or loss, but which I certainly should put down under the latter head. Cleanliness, warmth, and regularity of feeding, are the principles to be strictly attended to, and will give a greater return than any other system that I have had an opportunity of observing.

Hoping that this short statement may be of service to you,
I remain, Sir, yours respectfully,
R. KAY.

The next letter is from Mr. Donkin, of Northumberland:—

Bywell, Felton, Northumberland, Oct. 20, 1855.

DEAR SIR,—I have the honour to acknowledge the receipt of yours of the 18th, and have much pleasure in replying to its purport.

The use of hay in the process of fattening cattle is favoured very little indeed amongst us. Upon the large turnip farms in North Northumberland, the cattle are first put upon white turnips till about the new year, when swedes constitute the principal food. The use of cake and bean meal, though far from universal, is pretty extensively adopted by those who are in advance in the science of animal physiology; yet you will seldom or never meet with the consumption of hay. Our wintering cattle—those intended for grazing the next summer—have a small portion of turnips, with an unlimited supply of straw. Where box or stall feeding is in vogue (and I am not singular in my doubts upon the advantages of box or stall feeding over that in folds when judiciously constructed), the steaming apparatus is frequently called into requisition in the preparation of linseed, chaff, meal, and turnips, with perhaps a little hay.

Upon the pastoral farms which lie on the west part of Northumberland, where large herds of black or cross-bred cattle are wintered, hay is given generally during stormy weather. Graziers are always fonder of cattle wintered upon coarse old land hay than of cattle wintered upon turnips, especially Swedish; but with a full crop of turnips (and many farms here grow from 100 to 250 acres) and plenty of well-won bean or pea straw, we care very little about our supply of hay. Though, mind, I don't approve of our general method of feeding our horses, nor cattle either. A great improvement might be found in the aid of proper machinery for the cutting, steaming, and complete preparation of food for our domestic animals.

The subject which the London Farmers' Club has before it for discussion is well worthy of the unprejudiced reflection of every farmer. There are few districts where great improvements are not wanted in the feeding of cattle, not only in the construction of the housing, but in the preparation and kind of food. One great desideratum with us in these parts is shedding for the feeding cribs or troughs within our folds. I am convinced that loose folds, constructed upon rational principles, to hold two or four fat beasts, will be found superior to any boxes or stalls that I have ever seen, with one exception, those of Mr. Joseph Laycock, upon his estate of Lintz Hall, Gateshead, a gentleman who will, I am sure, be willing to give you his valuable experience upon a new system of box feeding.

Old prejudices are difficult to break down, though it must be admitted that our savans ofttimes puzzle common minds by

the infinitesimal philosophy they attempt to elucidate upon the increase or reduction of the adipose tissues of animals. I have no hesitation in tendering my humble opinion in favour of steamed food, consisting of bran, linseed, turnips, and meal, with dry cake (no hay), served comfortably up in well-sheltered cribs or troughs, in a loose fold, where cattle can bask at pleasure in the sun, instead of being imprisoned in a dark chill gloomy box, or tied up in a stall, without ever having their itchy hide relieved by comb or brush. If cattle are tied up to fatten they ought to be well groomed.

I see in the *Field* newspaper, of this day's date, an article upon feeding cattle with molasses, by Mr. Beckett, Agent to the Suffolk estates of —— Tollemache, Esq. Mr. Beckett says—"I was told by a leading agriculturist, who had a good deal o experience in its use, that he believed the number of sheep and cattle upon many farms would be augmented 25 or 30 per cent. by giving roots in diminished quantity, with a liberal supply of sweetened cut straw. With the limited experience farmers have in the use of molasses, the comparative value of manure made by using treacle has not been ascertained."

The feeding properties of sugar are well known in America, where pork of very superior quality is produced by its use; and it may be worth while giving the experiment of molasses with cut straw to cattle a fair trial.

I shall feel obliged by a transmission of the London Farmers' Club's discussion upon the question in view.—I am, dear Sir, yours truly, S. DONKIN.

In consequence of Mr. Donkin's allusion to Mr. Laycock's system of box-feeding, I wrote to Mr. Laycock, and received the following answer :—

Lintz Hall, Newcastle-upon-Tyne, Oct. 29, 1855.

SIR,—I am favoured with your note of the 23rd. I should have been glad to have given you a more detailed account of my operations in cattle feeding, had there been more time.

I have only a small farm of land in my own hand (120 acres), principally in tillage, and my object in feeding cattle is to consume the turnips I grow, say 18 to 20 acres per annum, and to make as much good manure as I can, and, which is the main point, to get as much profit as I can on the beast fed.

I do not breed the stock: I buy them about October, and put them up to fatten, and sell them off as they are fit for the butcher, always having in view the supply of turnips.

In order to carry out my plan, I adopted in 1848 the box system of feeding, and built a convenient steading, a plan of which you will see in the 11th volume, part 1st, of the *Royal Agricultural Society's Journal*, page 215.

I find the boxes answer a most excellent purpose. The manure is entirely preserved from waste, both liquid and solid. The cattle are easily kept clean, and I think the animals thrive better than under any other system.

My mode of feeding is for an ox, say 60 stones, 14 lbs. per stone—

	s.	d.
3 feeds cut swedes per day, 63 lbs. each, = 12 cwt. per week, at 7s. per ton	4	2½
2 lbs. crushed linseed per day, steamed and mixed with steamed chaff	1	10½
Attendance each beast	0	6
	6	7

Each beast produces, including the litter, 5¾ cwt. manure per week, which, at 7s. 6d. per ton, is equal to 2s. 2d. per week. This pays for the linseed and attendance, and I get clear 7s. per ton for the turnips. I enclose you a statement of my last year's feeding, which is about an average of each year's stock of 25 head of cattle.

Any other matter of detail I shall be at any time glad to supply.—Your obedient servant, JAS. LAYCOCK.

From the account referred to, it appears that Mr. Laycock bought 25 head of cattle for £366 18s., and made a profit upon them of £156 1s. 3d. Having again written to Mr. Laycock, I received from him the following :—

Lintz Hall, Newcastle-upon-Tyne, Nov. 1, 1855.

SIR,—I am favoured with yours this morning. For mixing and giving bulk to the steamed linseed, I use the chaff from the wheat, &c., that is the chaff from the thrashing barn; but if I have any spoiled or inferior hay, I cut it into half-inch chaff with a chaff-cutting machine, which I drive with the steam engine that drives the thrashing machine. This I mix with the corn chaff, and steam it altogether, and mix it with the linseed.

I remain yours truly, J. LAYCOCK.

These are all letters received from Gentlemen in the North of England. The next letter is from Mr. E. Cottingham, who resides in the northern part of Suffolk. It is as follows :—

Covehithe, Wrangford, Suffolk, Oct. 12, 1855.

MY DEAR SIR,—I am afraid that you will not derive much useful information from me; but I will willingly explain to you the system of grazing which I have settled down to, after having tried various plans, steaming, boiling, &c., all of which I am convinced are attended with more labour and expense than is profitable.

You are aware that my farm is principally arable at home. I have about 160 acres of good marshes, twenty miles from home. I generally graze two hundred head of cattle in the year. I buy about 130 or 140 good old beasts in the spring. If I tell you what they cost last year you will judge what they are. Fifty cost £16 each, fifty-four £13 10s., sixteen £20 10s., fifteen £14 15s. They were all kept in the yards about six or eight weeks, upon one to two bushels of mangel each per day, according to the quantity of roots I happened to have. I cut the roots with Gardner's cutter, the same size as for sheep. In addition to the roots, I give each bullock a quarter of a peck of pea, bean, or barley meal, whichever is the cheapest, and one peck of straw chaff, roots and all mixed up together. The sixteen best bullocks had 4 lbs. of cake also. All the lot had straw to pick over. About the middle of May all the beasts are sent to marsh. Three lots of them come home into the yards the first of October, the others this week. I divide them into lots of about fifteen or sixteen, and put them loose into yards (about eighteen to twenty yards square). The yards have good wide hovels to the north and east. They have all the white turnips they will eat, cut into slices about three-quarters of an inch thick, until the swedes are fit to begin. When the swedes are finished they have mangel. The best beast I give 6 lbs. of cake and half a peck of meal, with one peck of straw chaff each per day. I never have any hay for cattle, only for the horses.

The other lots of beasts have 4 lbs. of cake and a quarter of a peck of meal at first. After a month I shall add 2 lbs. of cake and a quarter of a peck of meal.

I reckon to begin selling or sending some to London about Christmas, and have three yards empty by the middle of January to put some beasts in, bought about this time, to eat the tops of turnips and rough grass, which bullocks will receive the same treatment when in the yards as those now there, and will be sold out of the yards about June or July.

I think the principal art in grazing is to buy old bullocks of a good breed, and give them plenty of good food (Hear, hear). I never saw any bullocks made fat without good food, and plenty of it (Hear, hear, and laughter).

I am quite aware that the price of cake is much advanced but so also is the price of beef. I generally buy my linseed cake in the summer.

Probably I may see the discussion on the subject in the *Mark Lane Express*, and shall be pleased if I can profit by any remarks there made. Any other questions I shall be happy to answer.—I remain, dear Sir, yours very truly,

EDMD. COTTINGHAM.

Having thus shown, by the testimony of the gentlemen whose letters I have just read, that cattle can be fed without the use of hay, we will next consider in what way cut straw can be used in lieu of it, and the relative cost of the two articles. I am of opinion that, if 1 lb. of powdered cake be mixed with as much cut straw as a beast will consume in a day, the chaff being first slightly wetted, or the cake mixed with water, and then mixed with the chaff, it will be found nearly, if not quite, as nutritious as chaff composed of equal parts of hay and

straw. But, supposing that quantity insufficient to render the cut straw equally palatable to the cattle, you can, if you are feeding with cake, increase the quantity by giving more powdered and less large cake; or, if meal is being used, it can be given with the straw-chaff. But when cattle are well fed on cake and turnips, I have always seen them eat straw with the greatest relish. It is those that are weak and half-starved, from having nothing else to eat, that have no great liking for it. Next, as to the relative cost of the two descriptions of food; and I think that, in considering this part of the subject, it will be better to take the prices of hay, linseed, and cake at their average for the last seven years, instead of taking them at their present high rates, which are caused by peculiar circumstances, and do not affect the general bearing of the question. I will suppose the hay grown upon the farm, and value it at a consuming price; and, as the best is always selected for feeding beasts, and the tops and bottoms of the stacks used for inferior stock, I have the authority of a gentleman in my own neighbourhood, who has had great experience in valuations of farming produce, for charging it at 3s. per cwt., or 4½d. per stone. In order to ascertain the average prices of cake and linseed for the last seven years, I wrote to Mr. Levett, an experienced broker at Hull (through whom I have purchased my cake for the last three years, and to whom I would strongly recommend gentlemen to apply who may want anything of the kind from Hull), and he has given me the following particulars—

Hull, 27th Oct., 1855.

DEAR SIR,—I have your favour of yesterday, and have made out, from a selection of mixed dates, the following averages. I think it better to make the years from midsummer to midsummer, which I have done. It is no use troubling you with the various dates on which I make my statement; but I can send you the rough memorandum, if you choose. The result is as follows:—

	Average of 12 Months. Good feeding Linseed. Per Quarter.			Hull-made Lnsd.-cakes. Per Ton.		
	£	s.	d.	£	s.	d.
Midsummer, 1848, to Midsummer, 1849	1	19	8	—	8	1 6
,, 1849, ,, 1850	2	1	1	—	7	0 0
,, 1850, ,, 1851	2	5	8	—	7	1 1
,, 1851, ,, 1852	2	5	1	—	7	9 6
,, 1852, ,, 1853	2	6	10	—	8	5 0
,, 1853, ,, 1854	2	13	8	—	10	2 3
,, 1854, ,, 1855	3	1	3	—	11	9 0
From 1st July, 1855, to 27th Oct.	3	15	0	—	12	10 0

Price, 27th Oct, of fine feeding linseed, £3 18s. 0d. per qr.
,, ,, good Hull-made cakes, £13 7s. 6d. per ton.

I trust this statement will be found available for your object. It may, however, be well to look a little into the future, and to bear in mind the probability that both linseed and cakes will be dearer before the present winter is over. My own idea is, that seed will be very scarce in spring; and that cakes, between now and April, will be £14 (it is *possible* they may run up even as high as £15) per ton.—Yours very truly,

BENJ. LEVETT.

	£	s.	d.
N.B.—The average price at Hull of feeding linseed, weighing 53 lbs. per bushel, from midsummer, 1848, to midsummer, 1855, has been 47s. 7¼d. per qr., or per ton	12	11	5
The average price of Hull-made cake, for the same time, per ton	8	9	9
The difference in price in favour of cake, per ton	4	1	8

	£	s.	d.
Linseed-cake, at Hull, per ton	£8	9	9
Add for carriage	0	16	11
	9	6	8

As Mr. Levett does not here give the weight of the linseed, and thinking it better in making comparisons between that and cake to give the weight of each, I again wrote to him, asking the weight of the seed referred to in his first letter; and, as molasses is also recommended by some of my correspondents, I at the same time asked him to inform me what is its present wholesale price. I have received the following reply:—

Hull, Oct. 30, 1855.

MY DEAR SIR,—I have your favour of yesterday. If you estimate the weight of fine feeding linseed at 53lbs. per imp. bushel, it will be as near the mark as possible. As to molasses, the present value here is about 28s. to 30s. per cwt. The idea is not a new one. Some years ago (in April, 1851) I bought some for a friend for the purpose of pig-feeding. I believe it answered the expectation; but at that time the price was only 14s. per cwt., just about half the present value. I do not know exactly how it was used; but if you wish for more particular information, and will be at the trouble to address a line to Henry Briggs, Esq., Outwood Hall, near Wakefield, mentioning my name, I am sure he will tell you directly. Mr. Briggs is a near relative of mine, and was (and may be still, but I am not sure), President of the Farmers' Club at Wakefield, and I know he has bestowed much attention on these matters.—Yours very truly, BENJ. LEVETT.

The gentleman referred to (Mr. Briggs) writes as follows:—

Outwood Hall, near Wakefield, Nov. 1, 1855.

SIR,—I have great pleasure in replying to your inquiries respecting my having used molasses for feeding purposes. About four years ago, when the price of molasses was low, and could be obtained for 12s. to 13s. per cwt. at Liverpool, it struck me that as saccharine matter contains the chemical elements of fat in an eminent degree, and is, moreover, extremely palatable to most animals, molasses might be profitably employed in feeding and fattening cattle, and particularly pigs. I therefore purchased 2 tons, at the wholesale price, which I gave first to pigs at the rate of 1½lb. per day to each tolerably-sized animal, mixing it with their food. They throve extremely well upon this treatment, and fattened very quickly; but I afterwards found that for bacon pigs it did not answer, as the fat did not stiffen when cured, and melted away much on being cooked. I then gave the molasses to fattening cattle, at the rate of 2½lbs. to each per day, first diluting with water, and mixing it with their chopped hay and straw. The result was most satisfactory; and, had I continued to feed cattle on the scale that I then did, I should certainly have persevered in the experiment; but other avocations divided my attention. I should add, that for the fattening of pork pigs, the use of molasses I found eminently successful, and produced most beautiful and tender meat. —I remain, in haste, your obedient servant, HENRY BRIGGS.

Well, it appears from Mr. Levett's returns, that the average price at Hull of good feeding linseed, weighing 53lbs. per bush., from Midsummer 1848 to Midsummer 1855, has been 47s. 7¼d. per qr., or £12 11s. 5d. per ton; and of Hull-made cakes, for the same period, the price has been, at Hull, £8 9s. 9d.; being a difference in favour of cake of £4 1s. 8d. per ton. The difference is now much greater, being £7 4s. per ton, without the additional cost of crushing and boiling. This, I think, puts it out of the question at the present time, although I think it is the right thing to use, when more moderate in price, as a mixture with cut straw, from the great quantity of mucilage it yields when boiled. We will, there-

fore, return to the cake; and if we add 16s. 11d., which, with the discount, just about covers the carriage to my farm, we have a total cost of £9 6s. 8d. per ton, or 1d. per lb. You, therefore, by giving a beast 1lb. per day extra, increase the cost of feeding it 7d. per week. Now, as to the cost of hay, I find that 34 bullocks in one yard eat 20lbs. of chaff per day each, besides 6lbs. of cake, half a gallon of bean-meal, and 1 bushel of turnips. And, supposing it to consist of half hay, each bullock eats 70lbs. of hay per week, or 5 stone, which, at 4½d. per stone, costs 1s. 10½d., being a difference in favour of an extra pound of cake per day of 1s. 3d. per week. I do not know whether I have made out the case to your satisfaction, but I have come to the conclusion in my own mind that hay is not absolutely necessary in cattle feeding, but that its use adds greatly to the cost of both fat and store stock. Having occupied so much of your time on this, in my opinion, the most important part of the question, I will make such other remarks as the subject demands, as briefly as I can. And first, as to the kinds and quantities of food it is desirable to give. That must depend on a variety of circumstances, such as the age and condition of the beasts, and the length of time they are likely to remain in the stalls, and the relative prices of cake, linseed, beans, peas, barley, &c.; but I think a mixture of food always desirable. I hope, however, that no one has come here expecting to learn how to feed cattle without giving them a sufficient allowance of good food of some kind or other (Hear, hear). There is no plan more extravagant than to give an animal you intend to fatten just enough to keep it in its then state, for in that case all it eats is thrown away upon it, while by a judicious increase of food it may so improve as to pay for all it eats. On the other hand, I must protest against the extravagant quantities of cake and meal that are given by some feeders, I know, amounting in some cases to 14 and 16 lbs. of cake, and in one instance to 18lbs. of cake, besides turnips, meal, and hay. Now I believe it is quite impossible that so large a quantity of rich food can be properly digested, and the whole, or anything like the whole, of its nutritive properties extracted. Except for the purposes of manure, it is in a great degree wasted. I have watched my feeding beasts very closely, and, whenever I have exceeded 8lbs. of cake and a gallon of flour, I have never perceived any corresponding benefit; on the contrary, they get dainty, and leave parts of their food, and soon get loose to the hand, instead of retaining that firmness of flesh which they had previously acquired. I therefore never exceed that allowance, and am by no means sure that it is not too great a one, unless for a short period. There may be an exception in large old worked oxen, but I am speaking of those of an average age and weight. Since writing the above, I have been favoured by Mr. Beasley, of Chapel Brampton, with a letter written to him by Mr. Keary, the agent of Lord Leicester, giving the particulars of the plan pursued by him on the Holkham farms; and, as there can be no higher authority, and as it is not only a strong confirmation of the opinion I have just ventured to give you, but contains much valuable information on the subject generally, I have made an extract of all that has reference to it, which I will now read to you:—

"In the spring of last year I was extremely short of mangel wurzel, and after a fortnight's consumption, I soon saw that my store would not hold out. I was then giving my full-grown cattle 2 bushels per head per day, younger steers 1½ bushels, and yearlings 1 bushel. It was necessary to devise some mode of economizing the roots, and I began by mixing wheat-straw chaff with the mangold, which was cut up small by Gardner's sheep cutter, reducing the quantity of roots from 2 bushels to 1½ bushel, and from 1½ to 1, from 1 to ¾ bushel. The stock, however, did not like the dry straw, and picked out the mangold, and did not *fill themselves* properly upon the reduced quantity of roots. I therefore hit upon the plan of wetting the cut straw with a weak solution of the coarse molasses (which at that time I could buy at 14s. per cwt.), and then mixing up with it the finely-cut mangold, and adding also to the feeding cattle the quantity of linseed cake (also ground fine) and meal they were allowed. It answered perfectly. Upon 1 bushel of mangold, 5lbs. of cake, and 3lbs. of bean meal, I *fatted* a great many oxen last spring, and I have no hesitation in saying that they grazed faster and did better upon 1 bushel of mangold, and 1½ or 2 bushels of cut straw as moistened above, than upon the 2 bushels of raw and unmixed roots. I was so satisfied with what I saw last spring that it is WRONG to give roots of any kind cut into large pieces, and unmixed with chaff, to neat stock, that I am at present feeding 250 head as I have described, substituting turnips of course now for mangold. My best lot (oxen that will weigh when fat 66 stones) are eating barely 2 bushels of swedes, about 1½ bushel of wheat-straw chaff, moistened with the molasses solution, 5lbs. linseed cake, and 4lbs. of bean meal, all mixed up together; and I never saw cattle do better. They never *scour*, as neat stock frequently do at this time of year; are never blown, or hoven, and fill themselves well. I am sure this is an economical mode of fatting cattle; and I conceive that I save the following quantity of food. Many of my neighbours, who do not approve of the system, are giving the same description of oxen 3 bushels of turnips per day, and 14lbs. of linseed cake. Now, I am quite sure that such a quantity of roots and cake is such a relaxing food that a great deal of its nutritive qualities passes off by the bowels; and a close observer of such things must often have noticed an oily appearance in the dung of oxen eating too much linseed cake. One of the most particular and best farmers on the Holkham estate always says that he can make more beef with 6 or 7lbs. linseed cake and 4 or 5lb. of bean meal than with an unlimited quantity of cake; and I quite agree with him. I must now describe the mode of mixing the coarse molasses. I will give you a case. At one feeding-place I am using 42 lbs. of coarse molasses per day, which is dissolved by first putting to it a pail-full of *boiling* water, and afterwards as much cold as required: in this case we use about 50 gallons of water, which will moisten 60 or 70 bushels of straw. But the rule I lay down is this: 1½ gallons of water to 1lb. molasses, which moisten about 1½ bushels of straw. I consider the turnip-cutter exhibited at Smithfield for cutting the roots into very *thin slices* a great improvement, and I contemplate very soon being able to do without the treacle by using them. I think if the chaff is mixed up with this *root* chaff and allowed to lay some time, the juice of the root will be taken up by the chaff, which will moisten it sufficiently, and induce the stock to eat it without the treacle. I shall not be satisfied until I can give *all* my sheep the same mixture. If it could be done, there would be fewer losses of lambs at turnips, and they would do better, as well as *economize roots*—a matter but little attended to, generally speaking."

I have received a letter myself from Mr. Keary to-day; and, as his practice now appears to be rather different from what it was when he wrote to Mr. Beasley, I will read it:—

Holkham, Nov. 3, 1855.

MY DEAR SIR,—Your letter of the 1st inst. reached me this morning, and it is the only communication I have received from you. Had your letter of the 6th ult. arrived in due course, I should most certainly have replied to it long since. I will endeavour to give you an account of my system of feeding cattle in small yards with *good sheds* and in loose boxes. *Stall-feeding*, or, as I suppose you mean tying up by the head in stalls, I never practise, except in a few cases—such as dairy cows: I rarely fat oxen in that way. On the whole, I prefer, for an arable farm, say of 500 acres, on which in average years it would be necessary to graze or fatten 50 or 60 oxen, to make the straw into manure, to keep about two-thirds of the cattle in *small* yards, well shedded, and the remainder in loose boxes. There can be no doubt that oxen will, generally speaking, fatten more quickly and consume less food in comfortable boxes than in large open yards—such as are too often seen; but to house all the cattle on a farm in boxes would greatly increase the cost of farm buildings; and I am well satisfied with the proportion I have mentioned. As a rule, 10 or 12 animals in one yard should not be exceeded, and then, by draughting out of each lot of cattle as they are bought all quarrelsome and master bullocks and all those who appear delicate, &c., and putting them into the boxes, a very good and not too expensive an arrangement may be made. Now as to the question of food. For the last thirteen years I have reared every year 40 calves, and kept the steer calves until fat at three years old, and the heifers either going into the dairy or fatted off; besides buying annually a considerable number of fatting cattle; and during the whole of that time no *long* hay has been used, except a small quantity to the oxen preparing for the Smithfield Cattle Show. I do not say that a moderate quantity of long hay for feeding oxen is not a very good thing, but I never could spare it; and I have made a great many very fat oxen and reared an immense quantity of young stock without a morsel, certainly never less than 260 in every year. My present system of feeding young store stock is this: The roots or turnips are cut into thin slices with a Mudie's slicer, and then mixed up with good sweet wheat-straw chaff, moistened with a mixture of coarse molasses and water in the following proportions: to 1lb. of coarse molasses put 1½ gallon of water, and this will moisten about 1½ bushel of straw. I add, according to the age of the animal, bran for young calves, and rape-cake for young steers, about 2lb. per head, and linseed cake about 3lb. or 4lb. per head for older steers, just preparing to be fattened. The great use and advantage of the straw and treacle is, that it saves roots; and I rarely give more than 1 bushel of roots to young steers, and 1½ bushel to two-year-olds. The molasses sweetens and softens the straw; and they eat it with great avidity when used to it. In some seasons I have kept lean steers healthy, and in as good condition as I wished, by 1lb. of molasses mixed as above in about 2 bushels or 3 perhaps of cut straw, and about 3lb. of rape-cake per day. For fattening oxen, I do not think it right to make this mixture. I have tried it, and find that they do better by a change of food, viz., ½ bushel of turnips at 6 A M, another ½ bushel before 8 o'clock, and at that hour a feed of cake at the rate of ½ a peck per head, mixed up with a small quantity of cut hay (about a *peck*), and as much cut wheat straw as they will eat: towards noon, say 11 o'clock, feed with turnips again, and about 4 o'clock in the afternoon, and then rack up at night with oatmeal and beanmeal, ½ peck of each, mixed with cut hay and straw, as in the morning feed. The quantity of turnips must depend in some measure on the size of the oxen. Our small Devons do not require more than 2 bushels per day, but I think large shorthorns or Herefords should have more—2½ or 3 bushels: beyond that I would not go. It is wasting roots to no purpose; and, if more food is required, increase the cake or meal. I am quite of opinion that in this county many hundreds of tons of turnips are annually wasted upon the cattle; and, from what I recollect of the system of feeding pursued in the midland counties, I fancy large quantities of long hay are literally wasted. I am quite sure that good sheds, *dry beds*, *small* yards or boxes, regularity in feeding, and *small* quantities at a time, are the great essentials in feeding all animals, and strict attention to those principles would save an immense quantity of valuable food. I have written this letter very hastily, and shall direct it to the Farmers' Club House, in the hope that it may reach you in time; and if it does, and proves of any service to you, I shall be glad. You will be sorry to hear that the pleuro-pneumonia has attacked our Devon herd here, and carried off already 20 of our best cows, and three very fine oxen feeding for the Smithfield Show.—In haste, believe me, yours very truly, H. W. KEARY.

There is one great advantage in the plan recommended by Mr. Keary, of making straw-chaff palatable to feeding cattle, namely, that it can be pursued at yards away from the homestead—a recommendation that does not apply to steaming or cooking food, a part of the subject that we will now consider. The question whether food should be given in a cooked or raw state is certainly an important one, but one on which some difference of opinion prevails; and, until the two methods are tested by a series of carefully-conducted experiments, it must remain an open one. Cooking has many advocates, and, certainly, where it is adopted, a less amount of food seems to suffice; but whether the saving of food counterbalances the cost of the extra labour and fuel, is more than I can say. It is, however, admirably adapted to straw-feeding; for when the chaff, roots, cake, and meal, are all blended in a hot state, you may safely leave out the hay, and the animals will be in a happy state of ignorance as to the omission. I know of no place where the cooking system is so well carried out as at the Park Farm at Woburn, under the superintendence of Mr. Baker; and those who have attended the sales of fat stock held there periodically can bear testimony to the admirable condition in which the cattle are exhibited, and to the complete success of the system; the particulars of which I have been favoured with by Mr. Baker, and will now read to you:—

Park Farm, Woburn, Oct. 17th, 1855.

SIR,—I received yours in due course, and with pleasure now contribute my "mite," as I consider the question you are about to discuss a most important one. I assure you the scarcity of hay has already taught me to economize it to a very great extent: it has always been the system here to use it liberally, but I find now by increasing the quantity of meal and roots, I can do very well by using, say ⅓ hay with ⅔ straw, cut up together. We have at this time 64 beasts fatting, which get 8lbs. of meal, 1 bushel of turnips, with chaff cut as above, each per day: the meal is *all boiled* in about 3 quarts of water to each pound of meal, and then it is poured hot over the chaff and roots (the roots being first cut) in alternate layers. We have bins for the purpose, in which the food is kept for 24 hours, and then it is given to the animals. This has been our usual system for some years, and I have always had cause to be perfectly satisfied with it during eight years' experience.

I think this a season particularly adapted for the cooking system, and I think it is also quite worth the consideration of your Club.

In connection with *hay principally*, I have at present never given more than 8lbs. of cooked meal per day to any animal; but I intend to increase the quantity to 10lbs. for the future, and then use a larger proportion of straw. What I call *meal* consists at the present time of an equal weight of beans, cake, and barley. I use cake rather than linseed, on account of its being cheaper per *ton*. Yours very respectfully,

G. W. BAKER.

I have also received letters from other gentlemen, who adopt cooking in a modified form. Mr. Beasley, whose Overstone Farm adjoins mine, after losing his meadow-hay by the floods of 1853, and his upland hay having also been

spoiled, made a compound of 1 bushel of chaff, 2 gallons of grains, 2lbs. of bean-meal, 2lbs. of Indian corn-meal, and 1 gallon of water. The chaff, meal, and grains are carefully mixed together, and the water added in a boiling state, and after being well stirred up, is left till the next day. This was given to the cattle at twice, with 8lbs. of cake and 1 bushel of turnips during the day, and straw put into their racks. Mr. Worters, of Cranford, near Kettering, informs me that he adopted a plan somewhat similar; but he first scalds the cake and meal with a sufficient quantity of water to make it in a liquid state, and then adds it to the chaff, which consists almost wholly of cut straw. He keeps his beasts a long time in the boxes, and begins by giving 1lb. of cake, 3lbs. of meal, and 1½ bushels of turnips, gradually increasing the cake and meal, and decreasing the turnips. Last year Mr. Beaseley used Irish moss boiled in water instead of the grains; but he does not think it possesses any great feeding properties. He concludes his letter by saying that the lesson he learned from the loss of his hay is, not how to do well without it, but rather its great value, the necessity of using it economically, and of keeping a stock of old for a like contingency. Mr. Druce, of Eynsham, has favoured me with his method of feeding, by means of a compound, which he thus describes, and with which he has, I believe, been very successful.

Eynsham. Oct. 26, 1855.

DEAR SIR,—I have been very much engaged of late, which is the reason I have not replied earlier to yours of the 6th, on the subject of the best system of stall-feeding beasts on arable farms. My usual method is to use sweet straw and hay of about equal quantities, cut into chaff about 2 inches long, with a compound of one-third linseed (steamed after being crushed), and two-thirds barley and bean meal of about equal quantities, of which I give one beast per day 1 quart linseed and 1 peck of meal mixed together to make s paste, costing 1s. 6d. each beast per day. In my opinion this compound will feed a beast quite equally to 15lbs. of oilcake. Generally speaking, I consider my system has an advantage over oilcake of 20 per cent. in money value, to say nothing of the great value of the good manure made on arable land. You are, no doubt, aware that I grow linseed.—Yours very truly, SAMUEL DRUCE.

I have two other letters from gentlemen in Norfolk, which, as they are short and to the purpose, I will read to you. The following is from Mr. Holley, of Aylsham:—

Burgh Hall, Aylsham, Norfolk, Oct. 20, 1855.

SIR,—In answer to your letter of the 18th inst., I write to say my system of feeding cattle is to mix one bushel of cut straw with an equal quantity of cut hay, and two bushels of turnips (cut small with Barnard and Bishop's turnip engine), also a small quantity of meal and oilcake, all well blended together. In case you wish to dispense with hay entirely, I would suggest that you mix with your straw some molasses. 1 lb. of treacle, dissolved in a pail of water, will moisten a considerable amount of straw, and makes a good substitute for hay. The mixture I have above given is intended for fat cattle. I alter the proportions for lean and growing animals by increasing the quantity of straw or wheat chaff. The subject that you have suggested for discussion is, I think, a very important one. To advantage, on most farms there might be great economy introduced.—Your obedient servant,

J. H. HOLLEY.

The next is from Mr. Hudson, of Castle Acre:—

Castle Acre Lodge, Oct. 19, 1855.

MY DEAR SIR,—In reply to your note I beg to say that I usually give my cattle 2 bushels of cut swedes, from 7 to 10 lbs. of linseedcake, 5 to 7 lbs. of beanmeal and 2 bushels of cut hay, each per day. But, as the hay is so short a crop this year, I fear I shall not be able to allow them more than 1 bushel of cut hay per day each. My cattle are all grazed in open yards, having good sheds round them.—Yours truly,

JOHN HUDSON.

The treacle, I think, is a good suggestion, and I shall try it on a small scale. If it answers, and returns to its former price, it will probably be considerably used; but for the present it will be more in request by the brewers and distillers, as a substitute for malt. The question whether cattle are best fed in stalls, boxes, or open yards with sheds round them, is not very material to the present discussion, as few of us have much choice in the matter, and must make use of such buildings as we have upon our farms. I will, however, observe, that there is no manure so good as that made under cover; and in no other way can you keep so many head of cattle in a given amount of shed-room as by tying them up. That they are more comfortable when at liberty in well-littered yards or boxes cannot be doubted, provided they have ample space; but unless single in boxes, they should always be tied up while eating their cake, meal, or turnips, or the master-beast will always get more than his share. There is only one other point on which I will trouble you, and that has reference to cake made from cotton-seed, lately introduced by Mr. Barber, of Poulton-hall, Chester, as a substitute for linseed-cake. Mr. Paget, of Ruddington Grange, near Nottingham, first mentioned it to me in a letter I received from him, in very favourable terms; and shortly after I was favoured by the following communication, and the analysis of Professor Way, from Sir Thomas Parkyns, Bart., of Ruddington Manor, on the same subject—

Ruddington Manor, near Nottingham, Oct. 15th, 1855.

SIR,—At the request of my neighbour, Mr. Charles Paget, who has told me that you are collecting information on the subject of feeding cattle, &c., for the purpose of discussing the subject at the Farmers' Club, I beg to enclose you the copy of a letter, and analysis of *cotton-seed cake*, which I received from Professor Way on Saturday last. The cake was part of a small quantity which Mr. William Barber, late an American merchant, but now residing at Poulton Hall, in Cheshire, imported to this country as an experiment on his own part, in order that he might test its feeding qualities. He has fed with economy several head of cattle with it, and I am assured that they showed a great preference for it even over oilcake. I am also informed that Mr. Barber believes that it can be supplied at £2 or £3 per ton less than linseed-cake. Under these circumstances it must prove to be an article of great use and benefit to the agricultural world, particularly as I understand that it would be possible to procure several thousand tons annually from America alone. I would beg to suggest that it would only be a proper compliment to Mr. Barber, as the introducer of the cotton-seed oilcake, were it to be named after him, "Barber's cake." It is possible that I may be enabled, in the course of three or four days, to send you some further information on this subject, should it be of any use to you, and remain, sir, yours obediently, T. G. A. PARKYNS.

A GENTLEMAN: Does Sir Thomas name the price?

Mr. WALLIS: No, he does not.

Mr. MECHI: I bought five tons, at £9 per ton.

Mr. WALLIS: The following is the letter of Professor Way—

15, Welbeck-street, Oct. 12th, 1855.

SIR THOMAS,—I have made a careful analysis of the sample of cake which reached me on the 3rd instant. In order that you may have the means of comparing it with other kinds of cake, I have enclosed a paper published by myself some few years ago, of which I beg your acceptance. With a full proportion of albuminous constituents, the sample of cake now analyzed contains nearly twice as much oil as foreign or English linseed or rape-cake; and I think it should therefore be superior to them in feeding and fattening properties: experience, however, alone can decide this point. The proportion of water (moisture) is also small, which is in favour of the cakes keeping without injury. Unless, therefore, it should in any way be distasteful to animals, I should form a high opinion of its value.—I am, Sir Thomas, your obedient servant,

(Signed) J. THOMAS WAY.

Sir Thomas Parkyns, Bart.

SAMPLE OF OILCAKE RECEIVED FROM SIR THOMAS PARKYNS, OCT. 3RD, 1855:—

Moisture	6.58
Oil and fatty matters	19.40
*Albuminous matters	28.31
Woody fibre	10.64
Starch, gum, sugar, &c.	26.98
Mineral matter in ash	8.09
	100.00

The mineral matter consists of—

Lime	0.34
Magnesia	0.84
Phosphoric acid	2.62
Silica	2.27
Potash and soda	2.02
	8.09

(Signed) J. THOMAS WAY.

Oct. 12th, 1855.

Agreeing with Sir Thomas on the importance of the subject, and wishing to see what kind of cake it might be, I wrote to Mr. Barber for a sample of it, which he has been good enough to send, and which I will now offer for your inspection [referring to a specimen on the table]. I think it looks rather promising; at all events for store cattle, if for no better purpose. Mr. Barber says—

Poulton Hall, Sutton, Chester, 1st Nov., 1855.

SIR,—I have your note of yesterday, and, as you desire, I will send by rail this evening a piece of the cotton-seed oilcake. I have no wish for discussion about its merits, and simply wish to have its merits fully tested; and I have therefore got some of my friends to try it. I myself tried it last year on twenty-four beasts, and found the result far better than I had ever done on linseed-cake. I have no quantity of it, but have ordered it to be manufactured for me to some extent in the United States; and when I get a supply I will inform you, and also the price—this last, of course, will depend upon the price of linseed-cake, and its relative value.—I am, your obedient servant, WILLIAM BARBER.

If I have not exhausted the subject, I am afraid I have more than exhausted your patience; and, thanking you for the attention you have been kind enough to give to my long and I fear not very profitable yarn, I will now resume my seat (cheers).

Mr. R. BAKER (Writtle) was certain that every one present must have been highly gratified by the very intelligent paper they had just heard read (Hear, hear), more especially as Mr. Wallis had incurred the trouble of collecting information among the most distinguished graziers in all parts of the kingdom, by which means he had been able to throw more light upon the subject than they could have obtained from all their previous reading. He (Mr. Baker) had for some time past directed his attention to the subject, and the practice he had followed was very materially to increase the quantity of straw, and to diminish the quantity of hay. For the last three years he had invariably fed his cattle on cut chaff, or, as it was usually termed, "chopped straw;" and having but a small amount of hay on his farm, he only used it in the proportion of one-third of hay to two-thirds of straw. At the same time, however, he was quite of opinion that there was no occasion to use hay at all, and that for the nutritious properties of the hay oilcake or meal might be substituted at a cheaper rate. It was not his practice to cut the chaff so short as some persons supposed it ought to be cut, because in the feeding of ruminants it was better not to cut it too short. The chaff and turnips, or mangold wurtzel, were mixed together, and his preparation was 75 lb. of mangold or swede turnips per day for a bullock of from 80 to 100 ordinary stones of 8 lb. This was pulped, made up at night in a heap; 3 lb. of bruised linseed having been macerated in cold water 48 hours, was then put upon the mass to moisten the straw, and in the morning as much meal as might be necessary, say from 3 to 6 or 8 lb. a-head, was sprinkled over it, and the bullocks fed. The meal was made up in the same manner for feeding during the remaining part of the day. The times he fed at were in the morning, middle of the day, and at night. Thus the bullocks were always fed in the same manner on the same description of food, and he was satisfied that it was better to feed them in that way than upon either a limited or an unlimited quantity of roots, or by giving them oil-cake or linseed in connection with the chaff, for the simple reason that if the bullocks had mangold wurtzel to any extent by itself they would not in that case eat the chaff readily. A cwt. of mangold wurtzel had about 95 per cent. of moisture in it, and it must be evident therefore that very little other moisture need be added to the cut chaff. The chaff was exceedingly beneficial as an absorbent of the moisture in the roots; but there was some difficulty in the process of slicing the turnips or mangold wurtzel; inasmuch as the bullocks easily separated them from the chaff; but on the other hand, if the mangold or turnips were pulled in pieces, or pulped, then the bullocks could not separate them, and would do much better upon them. If a machine could be devised for the purpose of pulping expeditiously, it would undoubtedly be of great service in the feeding of cattle. The statements contained in the letter which Mr. Wallis had read to-night tended, he thought, to support his system of feeding rather than the reverse (Hear, hear). Although they could not make good bullocks without good food, and a sufficiency of it, it was necessary to find the happy mean, and having ascertained the exact quantity that a bullock required give it to him, for it was just that sufficiency which

* Containing 4.46 nitrogen.

would be most beneficial to the grazier and advance the fattening process at the least possible expense. That was the point to which all graziers desired to arrive. If they used oilcake or meal *ad libitum*, no doubt they would carry out their object in one sense, but not in another—they would not carry it out with a profit to the grazier, as well as with advantage to the community at large. He believed there were great quantities of cake thrown away by the mode in which it was commonly given to the animals, and this might be taken for granted in every beast-house where the scent of the cake predominated in the manure. If the animal were properly fed, every portion of the cake would be digested and taken up by the system; and if oilcake were used, in preference to linseed-meal, combined with barley or bean-meal, care should be taken to give it in such quantities that the effect to which he alluded might not be produced. When the farmer was about to fatten bullocks, he should first ascertain the value of the different articles of food that might be used as equivalents. He should take the price of barley at per stone, the price of cake and linseed at per pound, and the price of bean-meal, hay, cut straw, and other ingredients on which bullocks were fed. He might, by keeping himself constantly informed on this head, select the articles which were most advantageous to him, and use them for a time, or change them, as it suited his purpose, because it so happened that the food of cattle, like other things, varied in price, and was cheaper at one time than at another. For himself (Mr. Baker), he might add, that he had always considered that 2 lb. of linseed-meal and 3 lb. of barley-meal, if they did not exceed the price of cake, were superior to cake; and with this conviction on his mind, he generally had his linseed and barley ground in that proportion. If, then, they ground 2 bushels of linseed and 8 bushels of barley, they would find that it produced an equivalent to cake—that was to say at the price of last year, and even at the existing price of linseed it was a question with him if linseed combined with barley-meal was not cheaper than cake. With regard to molasses, the great advance that had taken place in the price of sugar during the last fortnight puts the use of that article altogether out of the question. They must, therefore, look to other equivalents, and he believed they would be found in the inferior barleys which the country produced, and in linseed, the supply of which he hoped would prove more abundant than was anticipated; but whether they could obtain linseed or not, in barley or bean-meal combined with cake. Between the mode of using linseed and cake he made no distinction. Neither should be given to a bullock in its crude state; but both should be macerated in cold water, the linseed 48 and the cake 24 hours (Hear, hear).

Mr. Mechi (Tiptree) said, he apprehended that one of the main uses of food was to produce caloric in the animal, and, if more food was given than was necessary for animal combustion, the extra quantity was laid up in the shape of fat. It was material to remember this; inasmuch as it bore on the very large question of the cooking of food. His own experience was that where a great deal of heat was produced by means of a steam-engine, and was liable to be scattered to the winds, it was very desirable that the caloric thus generated should, as far as possible, be applied in warming the food of animals, so as to produce by that means caloric which would otherwise have to be produced by means of food. In such cases, he thought there was great economy in the administering of food in a warm condition. The manner in which the food affected the bowels of the animals depended very much on its temperature. He believed that roots administered in cold weather in large quantities abstracted heat from the animals, and thus tended to reduce it to that state of diarrhœa which, from their own experience, they all knew was not conducive to a plethoric habit (laughter). Moreover, in very severe weather the result of feeding sheep on frozen turnips was seen in serious losses to the farmer. As regarded straw, it must be recollected that it was composed principally of carbon; and if it were taken into the system, and part of it appropriated in the circulation, the result was greatly to economize food. The steaming of straw produced a smell very much resembling that of brewing. While the straw was being steamed on his own farm, gentlemen who were visiting the place had remarked to him, "Why, you are brewing"; the saturation and steaming of straw producing that impression. He ought, perhaps, to state that he sometimes used other ingredients with straw; pouring over it, for example, a small quantity of linseed-soup, or of meal. He quite concurred in what had been said about the desirableness of using a moderate quantity of roots. He believed that a bushel a day was generally sufficient, provided there were given a sufficient quantity of other food (Hear, hear). Perhaps in the North of England, where turnips were so succulent, it might answer to give more. Turnips ought, in his opinion, to be cut up small, and mixed with a large quantity of dried chaff, in order that they might enter the stomach in a proper condition. With regard to hay, he would observe that he had sold all the hay which he produced (not being a large grower) except the small quantity which he required for his horses. He had sold a stack of clover-hay and grass at six guineas per ton; and, supposing the money to be invested in guano, he was convinced that a ton of guano would produce more in the shape of roots than two tons of hay. It should be borne in mind that, after all, the object of feeding cattle was not direct profit, but the production of manure for the growth of cereal crops (Hear, hear). He could never believe that the farmer was paid for keeping cattle, except in so far as they enabled him to produce corn crops. The result of his own experience of the treatment of cattle was that there should be ample provision for ventilation, and that the food should be properly cooked.

A Member.—And that they should have a soft bed?

Mr. Mechi said that the doctors recommended a hard one, and he agreed with them in that respect. He was in favour of the use of open-boarded floors, and of that system of irrigation which consisted in the application to the land after breakfast of the manure made before breakfast. The whole of the calves fatted in Essex for the London market was fed upon bare boards. With regard to cotton-cake, he wished to say that he had bought some at £9 per ton, and he believed it to be cheaper at that price than oil-cake at £10 per ton. As long as he was a farmer, he would never give £12 10s. per ton for oil-cake while he could get rape-cake for £7 5s.

Dr. Ellis (of Richmond) said,—The able and interesting paper which has been read, and the important communications from so many practical agriculturists from different parts, have given rise to several suggestions, which I shall be happy to submit for the consideration of the meeting. The substances on which cattle feed and fatten contain three principal ingredients—namely, saccharine matter, albuminous matter, and oleaginous matter. The kinds of food referred to by the lecturer are rich in these ingredients; each of them contains, probably, more of one kind than another. Thus barley contains a large amount of sugar, which explains the reason why brewers and distillers use so much of it. They extract that substance, the other ingredients not being of use for their purpose. The sugar is passed through a chemical process, and produces a very expensive and unprofitable material, which is consumed in large quantities in this country. I shall make no further allusion now to that product. The albuminous matter may possibly be found in considerable quantity in straw, which is recommended for use chopped up, or in the form of chaff. Hay, it is thought, may be required in liberal quantities by some, in less by others, and not at all by several practical feeders. Hay, probably, contains a considerable proportion of saccharine matter; but being at a high price, and of limited cultivation by the majority of stock-feeders, it may be superseded by more profitable produce. A small proportion of limaceous or earthy matter is, doubtless, found in straw, the surface of it being covered with silica, which is useful for the supply of the material which constitutes the osseous system, or the bones of animals. The oleaginous property is found in excess in the oil-cake—more so than in any other feeding substance that has been named. Now it may be taken for granted that no animal that breathes on the face of the earth, from an insect to an elephant, can subsist on any one kind of nourishment. If it be asserted that oxen live on grass, it may be remarked, in explanation, that several kinds of plants or grasses may be found in every mouthful taken by them in the flowering mead. To give to an animal either of the substances under discussion alone, or an excess of any which, in combination, should form its proper food, will prove unprofitable, if not injurious. The saccharine matter, in excess, will purge; the oleaginous, or oil-cake alone, or in excess, will pass through the animal too rapidly to allow of its nutrient properties being all taken up and appropriated for the object contemplated, which is the making of fat. Probably the chopped straw, or chaff alone, would remain too long in the system, and prove an obstruction. To ascertain the precise relative quantity of these three main ingredients required for promoting an increase of flesh would, I beg to submit, be of great utility; but I am not aware that experiments have yet determined this important question, or that a statement of results has hitherto been given to the public.* On the subject of caloric, or heat in animals, it may be remarked that the supply of food is not to be regarded principally as a requisite for the production of caloric; for heat may be evolved from that which is not sufficient food in itself, though it serves, in combination, as *one* essential ingredient in the proper food for animals. For example, oil, which *alone* cannot constitute food, is now largely prescribed for certain invalids, as a means of supplying fuel to the diseased system. The oil administered contains no medicinal properties: no physician will tell his patient that it does. But the object for which it is taken is to supersede the consumption of more solid and enduring material in furnishing a supply of heat. It is for this purpose alone that oil is administered—to supply heat by its decomposition, or, so to speak, as it is blown off from the system. The rapidity of the pulsation of the heart and other causes induce, in certain invalids, an excess of inflammatory action, whereby not only is the nourishment given rapidly consumed to white ash, but even the substance itself of the body, the lungs and other organs, is burned away—in popular language the patient dies of "consumption." In such cases cod-liver oil has been found of use. These remarks may illustrate the statement that the production of animal heat is not the sole object in selecting food for animals. The adoption of *hot* food for animals, as recommended by one of the members who has just spoken, will likewise bear further consideration. Cold roots and other provisions, before they are received into the stomach, first derive a portion of heat during mastication, and it seems probable that before they are finally deposited in the stomach, they become too warm to intercept the progress of the caloric.† The practice of moistening food, and steaming or boiling it, is also worthy of further investigation, notwithstanding what has transpired from the valuable communications made by the lecturer and by other gentlemen who have addressed the meeting. If heat be applied to substances containing sugar or oil, a portion of these materials will escape with the steam, and be diffused in

* It has since been stated that the required analysis of the proportions of nutrient substances in the food of animals has already been given by Mr. Nisbet.

† Caloric does not originate in the stomach, but is produced by the food there received after it has passed through its chemical process, and as it is diffused through the arterial system of the animal, whether man or beast.

the air. That the gaseous properties of sugar are combined with the vapour is proved by our organs of smell when we approach the vicinity of a brewery or distillery. Or if any one visiting a tallow-chandler's melting-house will notice the roof, he must observe upon it a large deposit of fat. Thus it is seen that some considerable portion of these two substances, sugar and oil—and probably some other minute substances of value—must be lost by the application of heat. It is therefore a fair matter for discussion whether the evaporation of useful materials of food for cattle does not form a weighty objection against the plan of steaming or boiling. That kind of food which will continue for a sufficient time in the animal system to allow of its nutritive properties being totally separated or converted into real wholesome nourishment, and then taken up by the absorbents and distributed throughout the body, must be the most economical in the end. All the nutrition of the body is first assimilated with the blood; and that food which will most readily be resolved into the healthy red globules of the vital fluid, must most speedily supply the waste of the body, and deposit in the muscular cells and tissues the desired redundance of fat. We must remember that cattle and sheep are ruminating animals. This should induce us to believe that if a proper quantity of proper food be given, it must yield all its nutritive properties. After mastication the food is passed into the stomach, where it receives an admixture which renders it agreeable to the animal to return it into its mouth for a more complete maceration. Thus it seems probable that the whole of the nutritive particles of the food may be appropriated to the profit of the animal. The practice of supplying moistened food with an addition of cold fluid is likewise worthy of careful consideration. Some portion of the sugar contained in the food must combine even with cold fluid, as sugar has a great affinity for water. If a large quantity be mixed with the saccharine matter, the animal may consume it readily enough; but its rapid progress through the system will doubtless prevent some portion from being taken up as nutriment. Whenever certain substances which readily combine with water are taken in excess into the animal system, the urine, when tested, will indicate the fact that the organism has failed to secure the whole: in other words, the urine indicates the excess of supply or deficiency of absorption of the matters contained in food. Thus the substances intended for food may be partially lost, or go to afford their properties for liquid manure. I must beg to state that these remarks are intended only as suggestions for further investigation, and are not offered as facts established by my own experience. I find myself to-night in possession of suggestions which will induce me, when I return home, to attempt some experiments and observations which I trust may lead to useful results. On the whole, I have been led to conclude, from the important information furnished this evening, that roots and pulverised cereal food, combined in suitable quantities with straw chaff, constitute the requisite nutritives for profitable feeding and fattening of cattle; that the roots should be cut or macerated; and that, when duly mixed with the other articles of food, they will be more readily and completely decomposed and taken into the system than when given separately. I fear I have too long trespassed on the time of the meeting, especially after the important mass of information which has been submitted for consideration.

Mr. Thomas (of Bletsoe) said: Having had a little experience in the feeding of stock, he had found it a great advantage, generally, to cut and steam chaff. He had a room which was arched over, so as to shut the steam in, and was thus enabled to prevent the loss which had been described. While the steaming was going on, there was, as Mr. Mechi had stated, a smell like that produced by brewing. He found that horses would eat with avidity cut straw steamed; but he also found a slight admixture of hay very beneficial. He had been feeding with linseed, generally using about a bushel of linseed to about sixty gallons of water. He first ground and then boiled his linseed. When he commenced using it, he did not grind it; but his attention having been directed to the sparrows and other small birds eating the seeds in the manure, he took to grinding it; since which he had not observed anything of the kind. It was also necessary to use linseed or cake or something boiled with flour or meal. There was a great deal of waste in the troughs where the cattle fed. He had never himself adopted the system of mixing roots, chaff, or meal and cake together. Not having tried that plan, he did not know whether or not it was a good one; but he was inclined to think that it must be attended with waste. He invariably found, that where a moderate quantity of turnips were given to animals, some of the turnips were cut smaller than others, and when the food was mixed together, there must he thought, be a waste of the better kinds—a waste of cake, linseed, barley, or bean-meal, or whatever else might be used. With respect to stall-feeding, and tying cattle by the head, there was not a question in his mind on that subject. When he first went to Bletsoe, Lord St. John asked him what he thought of box-feeding. He replied that he had not had any experience with regard to it; but now, he repeated, there was no question in his mind as to its merits. He found that whenever bullocks were removed from stalls, and from being tied by the head, they improved very much quicker, and did better than previously. No doubt great expense was involved in the system of box-feeding; but he thought it might answer the purpose of many tenants to pay five per cent. towards the necessary outlay, rather than continue to pursue the old system. As to hay, he had never consumed more than a very small quantity of it, having principally used cut chaff mixed with a very small proportion of hay. One of his neighbours had remarked to him, and he concurred in the opinion, that cattle did best when they were supplied over-night with a small quantity of hay which was not cut, in order

that they might have it to ruminate with. As regarded the steaming process, he entirely agreed with Mr. Mechi; and having had experience in the matter, he was convinced that it was the cheapest and best mode of proceeding.

Mr. Moore (of London) said he had found hay the most expensive food that could be given to animals, taking into account the proportion of nourishment which it contained. He had found wheat-straw the most adapted for feeding, and next to that barley-straw. More now depended, in his opinion, on the judgment and care of the men entrusted with the animals than upon anything else. With the experience which he had had, he never thought now of giving grain whole to any animal whatever. As regards turnips, he was thoroughly satisfied that there was no advantage in steaming them, as they were in themselves sufficiently easy of digestion and assimilation. He had, too, entirely discontinued the warming of food, being convinced that, even in the case of feeding stock, it impaired digestion; while for young stock it was still more objectionable. It was true, no doubt, that a great part of the food of all animals was consumed in the production of animal heat. But he would never give warm food for that purpose; to preserve and retain heat he would exclude cold (Hear, hear).

Mr. B. Webster (of Malvern) said, being in the habit of visiting some of the first farms in the kingdom, he could bear out what Mr. Wallis had said with regard to the disuse of hay in the feeding of cattle. He also agreed with Dr. Ellis with respect to the use of warm food, and could refer to almost innumerable instances in England, in which the practice of warming food had been abandoned. The cutting of turnips had also been generally discontinued.

Mr. W. Bennett (of Cambridge) said it was astonishing what new light the course of time had brought on this subject. But a very few years since, it was thought marvellously bad economy to let animals eat straw at all (Hear, hear); it was regarded as an old-fashioned habit to which only clodpole farmers adhered. Now, it seemed, the great secret of success was to use plenty of straw in feeding. Surely, when not only doctors disagreed, but opinions changed so much with the lapse of time, it was important that, while "proving all things," they should take care to "hold fast that which is good." He was inclined to think that they were in danger that evening of running into the extremes of supposing that straw was as good as hay. He took special interest in this discussion because he happened to occupy a smallish arable farm, with no grass-lands. With him the production of hay was out of the question, and the purchase of it, at the present price, was as little to be thought of. While he was in favour of using straw, he also thought it very desirable to mix food. One of the greatest questions of the present day was the fattening of animals economically; and he agreed with Mr. Mechi that a large proportion of the profit must be sought in the shape of manure. As to the steaming of food for animals, his own experience had not been satisfactory. The conclusion at which he had arrived was that, when a steam-engine was kept on the farm and used frequently for other purposes, it might be desirable to apply it to the warming of food; but he entertained serious doubts whether it would pay to light a fire and raise steam for that purpose alone (Hear, hear). A new pulping machine had been lately brought out—he referred to Phillips's—which was worthy of attention; and he was convinced that where turnips or mangold wurzel were used it would be found most economical to have them pulped and mixed with chaff. One remark had been made which ought never to be forgotten, namely, that one great secret in the profitable feeding of animals was to have good men to look after them. The master's eye too, must be very often on the spot. For want of these requisites, in some of the most beautiful herds in England, he had seen some of the most miserable animals in the country (Hear, hear).

Mr. Wood (of Sussex) said that in fatting beasts he was in the habit of slicing the roots. As regarded caloric, he for one felt much obliged to Dr. Ellis for showing that what were supposed to be scientific notions were not always well founded. The expense, too, of putting up apparatus should always be considered; and as regarded the cost of attending to them, he thought bullocks ought not to cost more than sixpence per head per week. If there were thirty boxes, a man and a boy, at 15s. per week, might do all that was required. In feeding, his practice was to chop equal quantities of hay and straw together, and to wet them sufficiently to attach the meal, lest there should be any waste. As to mixing roots with chaff, his principal reason for not adopting the practice was, he confessed, that it involved a little extra trouble and expense. It appeared to be agreed on all hands that it was generally necessary to mix food in order that it might be properly macerated. With respect to the advantage of using linseed, on which Mr. Baker had dwelt, he felt indebted to the gentleman whom he had before-named (Dr. Ellis) for pointing out that a large quantity of oleaginous matter might cause the food to pass through the animal too quickly. On this account it might be worthy of consideration whether good cake were not preferable to linseed. At all events he should continue to feed his own animals upon cake until linseed were cheaper.

Mr. Owen (of Berks) said he had found stall-feeding, combined with the mixture of food, very beneficial. He agreed with Mr. Bennett that in carrying out that system they could not be too careful in the selection of the men to be employed. In particular, the feeding of cattle should be as regular as the clock. There was one important point which had that evening been lost sight of, namely, the best selection of stock for stall-feeding. Nothing could be of more importance with reference to economising than the selection of stock which would make flesh most rapidly and at the least expense.

Mr. Thomas (of Lidlington) said, long before he heard

the very able paper of Mr. Wallis and the extremely interesting letters which he had received from different parts of the country, he had made up his mind that hay was not at all essential to the proper fattening of cattle for Smithfield market. This fact had been impressed on his mind year after year in the most stringent manner. Mr. Bennett had alluded to a period when, as he remarked, the farmer who fed animals on straw was thought to be acting erroneously. Even at that time, however, it was considered wrong to give animals straw without accompanying it with something else. What they had to discuss that evening was, whether for a given value of hay they could not find an equivalent which would prove more economical than hay in the fattening of bullocks; and from the letters which they had heard read, he inferred that by a proper mixture of food, roots, oilcake, and corn, mixed with a due proportion of straw, they could produce beef much cheaper than they possibly could by using hay of the ordinary market value. There might be peculiar situations in which hay, being abundant, would be cheap; for example, there were extensive meadows which were annually flooded. But speaking generally, he would affirm that the farmer who had only a small quantity of grass land, and that of ordinary quality, could not devote it to any purpose which would yield him so small a return as that of growing hay to fatten bullocks in winter (Hear, hear). With regard to the cooking of food, when they happened to have a high-pressure engine upon the premises, and when the whole of the waste steam from that engine instead of going up the chimney was allowed to go into the chaff-house to cook the food it would be well; but he had no hesitation in saying that to buy coals expressly to cook food for the fattening of cattle was a waste of money. He had tried one system against the other year after year, and he was at that moment the possessor of one of Stanley's large steam apparatus, which for the last two years had stood perfectly idle. He thought that oilcake, if genuine, was, ton for ton, more useful for the feeding of cattle than linseed. With regard to Swedish turnips, he was convinced that it was best to give them to cattle in a raw state, provided they were not frostbitten. His own plan of feeding was to give them a bushel of turnips twice a day. Immediately after these they had their chaff, bean-meal, or broken oilcake mixed together. These they always ate before lying down; and he apprehended that if they were not sufficiently mixed in the manger, they became so in the stomach of the animal. With regard to the number of times that the cattle should be fed per day, he thought that too frequent feeding was bad. Some persons were in the habit of feeding them four or five times a day; but in his opinion three times a day was sufficient, provided the stalls were properly cleaned out. This appeared to him far better than disturbing them with a number of little meals in the course of the day.

Mr. BRADSHAW (of Surrey) said he might mention his experience of last year in feeding cattle on linseed and barley. Having forty beasts tied up—Devons, Shorthorns, and Herefords—he adopted the plan of giving them linseed and barley; but he found them constantly in a scouring state, and the result was unfavourable.

Mr. MECHI: Were they ground together?

Mr. BRADSHAW: Yes; the cake was ground and steeped for forty-eight hours, then put in the straw, and chaff and barley-meal were placed upon it. He first used 2 lbs. of barley-meal and 1 lb. of linseed; he afterwards altered the proportions, but without obtaining any benefit. He was now using oil-cake with barley-meal, half and half.

Mr. WALLIS then replied: He said, as to the comparative advantage of cake and linseed, he could not concur in the opinion expressed by Mr. Baker. When oil-cake was low in price, and when therefore linseed as compared with cake was cheap, he used a great deal of linseed; but since the state of things was reversed he was decidedly of opinion that cake was the most economical article of the two. He believed that, pound for pound, cake was as nutritious as linseed, and it was certainly not so relaxing. As to the rape-cake recommended by Mr. Mechi, he had made but one trial of it, and then he could not get his cattle to eat it; he was obliged, in fact, to drill it in for corn.

Mr. MECHI: Go to Mr. Briggs's.

Mr. WALLIS: That is the very person of whom I bought mine (Laughter).

Mr. BAKER observed that much depended on the quality.

A GENTLEMAN requested Mr. Wallis to state his own practice with regard to the feeding of cattle.

Mr. WALLIS said his practice was to take up his best beast about the second week in October. He began by giving them 6 lb. of oil-cake, ½ lb. of barley-meal, and a bushel of turnips (he never exceeded a bushel) each per day; increasing the quantity of cake, ultimately, to 8 lbs., with a peck of barley-meal. Notwithstanding his advocacy of straw, he was using one-third hay for the best animals. There were a number of other animals to which he gave no hay at all. With about 5 lbs. of cake, or with meal, cut-straw, and a bushel of turnips, these last did very well. He gradually increased their allowance to 8 lbs. of cake and a gallon of meal.

On the motion of the Chairman, the following resolution was adopted unanimously:

"That this meeting is of opinion that hay, for feeding cattle, may to a great extent be beneficially superseded by straw chaff in connexion with other descriptions of nutritious food; and that the judicious combination of food at the time of feeding is attended with great advantage."

On the motion of Mr. Thomas, seconded by Mr. W. Bennett, thanks were voted to Mr. Wallis for the able manner in which he had introduced the question.

And on the motion of Mr. Mechi, a similar compliment was awarded to the Chairman.

MIDDLE-CLASS EDUCATION.

By Lord Ebrington:

IN REFERENCE TO

HIS PRIZE OF TWENTY POUNDS FOR THE SONS AND RELATIVES OF DEVONSHIRE FARMERS.

A PAPER READ AT THE OCTOBER MEETING OF THE COUNCIL OF THE BATH AND WEST OF ENGLAND SOCIETY FOR THE ENCOURAGEMENT OF AGRICULTURE, ARTS, MANUFACTURES, AND COMMERCE.

[We willingly give insertion to the following paper, though hardly prepared to admit that the agriculturist now needs any such incentive towards obtaining for himself these first principles of an English education.]

Having already repeatedly made public, both in writing and by word of mouth, my impression as to the extent and causes of the relative deficiency of the means of education for the middle classes in general, and for the farmers in particular, I need not here go into the whole question again. Nor need I repeat how sincerely anxious I feel that farmers and farming should keep pace with the progress of other classes and other arts. I will observe, however, that if things go on as they do now, I augur more favourably for some time to come of the professional than of the social prospects of the farmer; and for this reason: Though, on the one hand, I am convinced, from the decided advance which agriculture, like all other arts, has latterly been making, that a combination of science with practice, and an acquaintance with the experience of a wide circle of agriculturists, attainable only by the well-educated, will become gradually more and more indispensable to profitable farming; yet, on the other hand, the more I see of farming and farmers, the more sensible I become of the very great amount of valuable practical knowledge they, for the most part, have of their particular business. And though highly educated gentlemen, on the strength of the really fuller knowledge they have derived on certain agricultural points from their wider range of reading, reflection, and travels, sometimes flatter themselves they can give regular farmers general lessons in their trade; yet, the more I am able to learn of the comparative pecuniary results of professional and of amateur farming in general, the more highly I am inclined to rate the regular farmer's superiority in whole branches—and those among the most important—of that business. This, however, makes me only regret the more that, for want of some additional education, so many good farmers and sensible men should, to so great an extent, be restrained from advancing agriculture by the freer communication of their knowledge to others, and from more usefully serving the public in various capacities, and should be thus prevented from doing more justice to themselves in the eyes of the community.

My object in offering the present prize is not merely to give young farmers an incentive to exertion, but also to endeavour to ascertain (with a view to its amendment, if necessary) the means of education at present practically available for that class in Devonshire—I mean of general education, as distinguished from business training. I cannot believe that, in the present day, any ascertained deficiency will long be allowed to continue in this country without some effort being made to supply it, more especially if the class affected be one so powerful and so capable of manfully overcoming difficulties as the agricultural body has recently shown itself to be. In the present instance this accurate knowledge is the more essential, because we have some reason to believe, not only that more has latterly been done for improving the education of the classes both above and below the farmers than for them; but also that the present generation of farmers find, with regard to the education of their children, some disadvantages which their predecessors did not before the days of Government grants, when such local schools as existed were, for the most part, self-supporting. As it is to the masters of the surviving schools of this class that we shall be mainly indebted for the preparation of the candidates that may present themselves, so it is to them also that we must chiefly look for information on this subject. In this investigation none can be more interested than these teachers: and I would put it to all able and earnest masters of middle-class schools, whether they have not experienced the want of some impartial and recognized standard in their too often unequal competition with unscrupulous pretenders, to the honourable office and title of preceptors. I would ask them to consider whether the institution of some public test of their pupils' proficiency would not, while encouraging those pupils to increased exertions and longer stay at school, at the same time supply to their establishments an evidence of their due qualification or certificate of excellence such as the examinations for University degrees and honours have long furnished to the schools of the higher classes—and have furnished, I will venture to say, with great advantage to them all, but more especially to those which, though some of them simply grammar-schools by their foundation, have—thanks very much to these examinations—won a world-wide distinction as the public schools of England.

The establishment of special examinations to test qualifications with a view to the selection of the right men for the right places, is becoming one of the questions of the day. Witness the examinations recently set on foot for the Indian service by the Indian Government; for the Engineers and Artillery service by the War Department; for lawyers by the Inns of Court; and last, not least, those projected for our civil service by the late Government. But it is to be observed that as yet the more general character of University education does not appear by the results to have at all unfitted University men for distinguishing themselves in these more technical and special examinations; nor does the value of academical distinctions appear to have been at all depreciated by the lucrative prizes held out at these newly-instituted contests.

It has yet to be proved whether the establishment of something like a standard of middle-class education, by means of some examinations analogous to those of our Universities, would not prepare the way for, instead of obstructing, and be assisted, instead of obscured by, any subsequent trials of more technical or professional qualifications. I believe this to be a

desideratum much wanted. Whether it can be supplied remains to be seen. The Society of Arts, by the examinations it has lately instituted, has made a vigorous effort to do so. As I stated in my letter to Mr. Chester, the Society's comprehensive character, its more than centenary existence, its ties of affiliation with almost every town in England, and the countenance of its Royal President and distinguished Vice-Presidents, afford it great advantages for this work. We shall see by the result of next year's examinations whether the Society has hold enough upon the nation at large to succeed in its object. I hope it has. I fear, however, it certainly has not upon the rural part of the population; and it is in them I, as a country gentleman, must feel the deepest interest.

I have heard it indeed suggested that the Universities might at once strengthen their hold upon the country and render great public service by undertaking this task; but they are at present, and must continue for some time, too much engaged in the work of internal reform to admit of our reasonably expecting this of them. Whether Government examinations, and the certificates to be obtained at them, could ever supply the desideratum, is a question, even supposing Government patronage to be distributed among the successful competitors at examinations for different kinds of Government employment, instead of, as heretofore, almost entirely among political partisans. But one disadvantage would attach to the Government's being regarded as the chief, if not the sole source of educational distinction for the middle classes. I mean the encouragement liable to be thus given, unless great care be taken, to the growth of a body of highly-educated place-expectants; unhappy and unquiet, because looking exclusively to general literary attainments, instead of to special qualifications, as their claim for employment; and still continuing to do so after reaching the age when men, as a rule, should be branching off, if I may so speak, from the general highway of youth into the different byways leading to the several fields of their respective adult employments.

It was under these impressions that, before making trial of the Society of Arts, I was led to think of the plan of county honours and county degrees mentioned in my letter to Mr. Chester. As this obviously, however, could not be carried into effect without larger and more influential co-operation than I had any right to expect for any project of mine, I determined to take the step which the Council were so kind as to honour with a vote of approval when I mentioned it to them at Tiverton. Having said thus much to put the Council fully in possession of my views, and to secure those views, as far as may be, from misconception, I will proceed to the details of my scheme.

(1.) With regard to the candidates for the prize, my own idea is that they should be young men *bona fide* engaged in agriculture, the sons or relatives of Devonshire farmers (whether freeholders or tenants), mainly depending for their incomes upon the pursuit of agriculture.

If occasion should arise for a more stringent definition in this respect, the £50 franchise would perhaps the more fairly indicate the minimum for renting farmers, because it is with their educational qualifications for their position as Englishmen of the middle class, and for their duties as citizens of a free country, that we are here concerned, rather than with their technical or professional knowledge as persons engaged in the business of farming. The standard adopted for tenant-farmers would furnish a sufficient basis for determining the limitations in the cases of freeholders or copyholders. It seems unnecessary to fix a maximum; as the Committee would practically, I believe, find no difficulty in deciding whether or not any one offering himself as a candidate was or was not, from present position in society, or from past advantages of first-rate school or college education, so far above the standard of the class I seek to benefit as to be an unfair competitor for the others to have to encounter.

(2.) The object of limiting the age of candidates to eighteen and twenty-three inclusive, is simply to insure their having all fairly committed themselves to the pursuit of agriculture, and being so far removed from boyhood as not to repel from competition those just arrived at manhood, and already entering upon the business of life. But as I have announced my intention of offering the same prize for three years in succession, those who are yet rather too young to come forward as candidates, may look to doing so hereafter, and begin forthwith to prepare themselves accordingly.

(3.) I will refer to my often cited letter to Mr. Chester for the reasons which lead me to require from the candidates certificates of competent Scriptural knowledge as a necessary part of an Englishman's acquirements, on grounds not religious only, with reference to a future world, but also purely secular, with reference to the world that now is, to society as at present constituted in England, to our English laws and English institutions.

(4.) With regard to the subjects of examination, they have this year been purposely limited to three, viz. the English Language, the History and Geography of the British Empire, and Practical Mathematics—some acquaintance with all of which is undeniably required by every Englishman of the middle class who can be considered educated up to the standard of his position.

(5.) With regard to the points chiefly to be aimed at in examining upon these subjects, I have conferred with the three gentlemen who have so kindly undertaken the laborious duty of conducting the examinations, and I am happy to find a general concurrence between their views and mine.

(*a*) The knowledge of the English Language I seek to test and elicit relates not so much to correct grammar, though that of course is implied, as to some acquaintance with the force and value of words, and the power of faithfully representing thoughts and things in language; that is, of expressing what is meant, so as to convey within a reasonable compass neither more or less than the sense intended to be conveyed. Mere grammar, the dry bones, so to speak, of the language, cannot of itself perform this higher, and, as it were, vital function. Indeed if there must be a deficiency in either one or the other, it had far better be in grammar than in expression.

No one who has not the command of a vocabulary sufficiently full and appropriate upon any given subject can without undue prolixity make himself thoroughly understood about it; or speak or write effectively, even if he can himself think accurately upon it, which, since words are thoughts, is in many cases far from easy. On the other hand the employment of exaggerated language in the attempt at oratory or fine writing, while it is far more repugnant to good taste than the want of point and precision resulting from a defective vocabulary, for the same reason tends to convey impressions at least equally inaccurate. But every one must have heard and read much that was more or less incorrect in grammar, and yet perfectly intelligible and to the point, often very graphic and sometimes even eloquent. This classical scholars well know from occasional examples in the best authors. Still even were it otherwise, the practical character of the classes here in question requires that their education should deal with substance in preference to form.

(*b*.) The History and Geography of the British Empire may, I think, be well taken together, as they happen in the case of our particular country to be closely connected with each other.

What I should especially seek here in the candidates would be a fair acquaintance with the outline of the History of the Empire, of its principal events, particularly of its wars and conquests, or discoveries, and, in connexion with these, of the course of its colonization. To this, as of not less importance, especially for men engaged in the business of raising food for the population, I should add a good general idea of the character, products, and resources of the United Kingdom, and of those numerous colonies and dependencies which together make up the British Empire.

The consideration of the history and geography of that mighty empire in this point of view seems to be better calculated to kindle sentiments of pure and undivided patriotism in Englishmen, than would be the study, to an equal extent, of the history of the English people, of the growth and development of our social organization and political institutions; because such a study necessarily brings men into contact with party and controversial questions still debated at the present day. Moreover, the study without which a real knowledge of our history viewed in the latter aspect is not to be acquired, must be far deeper and more systematic, and demands powers of philosophic reflection hardly to be attained without longer and severer mental training than it is reasonable to pre-suppose in the candidates to whom I offer my prize.

(c.) With regard to the third subject, viz., Practical Mathematics, what ought to be required would seem to be a thorough knowledge of the earlier rules of arithmetic, and of the first principles of the mechanical powers, of book-keeping, and of mensuration. I say of the principles, because it is far more important to have a thorough understanding of principles than a familiarity with those convenient formularies which, though invaluable in the daily business of life, cannot of themselves enable any man to deal with new and unexpected cases; and, if merely learnt by rote, give none of the valuable mental training furnished by the process of thoroughly mastering any subject.

In conclusion I will only add how anxious I am that the three examiners should be relieved from all trouble about this matter not inherent in the nature of their duty. And indeed it would seem on every account desirable that a committee should take off their hands any questions that may arise as to the admission of persons proposing to present themselves as candidates, &c. I would therefore venture to ask the council to designate some Devonshire members of the Bath and West of England Society, whose assistance I might solicit for this purpose with the high sanction of the Council.

After some remarks upon the above statement of his Lordship, it was proposed by Mr. T. D. Acland, and seconded by Mr. A. H. D. Troyte—

That the Council beg to thank Lord Ebrington for communicating to them the arrangements which he proposes to make for awarding the prize which he has offered to the sons and relatives of farmers in Devonshire, and to assure him that whatever tends to promote so desirable an object cannot fail to be a matter of interest to them.

It was proposed by Mr. Acland, and seconded by Mr. Dymond—

That the Council understanding that his Lordship does not propose to make the Society responsible for the details of the proposed examinations, are happy to learn that there is reason to believe that some active members of this Society are prepared to co-operate with his Lordship in carrying out the proposed plan.

Both resolutions were carried *nem. con.*

Sir Stafford Northcote, Bart., M.P., the Rev. Chancellor Martin, and R. Dymond, Esq., C.E., have undertaken to conduct the first examinations next Easter; and the following members of the Council, Mr. Sillifant, of Coombe, Mr. Thomas Hussey, of Waybrooke, Mr. Farrant, of Growing, Mr. Fry, of Culmstock, and Mr. Widdicombe, of Ugborough, to act as a Committee.

STEAM CULTURE.

ROMAINE'S PROPOSITION.

"Specification of John Henry Johnson: Machinery for Effecting Agricultural Operations.—No. 1151, A.D. 1853, price 1s. 2½d. And—

"Specification of John Henry Johnson: Digging Machines. —No. 35, A.D. 1855, price 1s. 1d.

Mr. Romaine, of Peterborough, Canada West, whose name must be familiar to many English farmers, through the patronage of Mr. Mechi, is the inventor of thea bove two machines, patented in the name of his patent agent, Mr. Johnson. The former of the two, taking precedence of Mr. Hoskyns's machine as to date, is that which was tried at Tiptree Hall; and one of the latter is now being exhibited in the Great Exhibition at Paris; while "others," we are told by the *Practical Mechanic's Journal*, "are being constructed in this country." The two, of course, now form one proposition, comprising an amount of mechanical detail which it will be impossible for us to do justice to within the narrow limits at our disposal.

In his *first* specification the patentee makes no fewer than 13 claims; and in the *second*, 7—making a total of 20! A combination of these with Boydell's Endless Railway and Intermittent Action is worthy the attention of the "eminent agriculturists" of this country quoted by the above Journal, who are anxious to give the rotary digging machines of Mr. Romaine another trial. Without the endless railway to prevent the wheels sinking in the ground and slipping at the same time, and intermittent action to get the full force of steam, we cannot see any mechanical data from which to deduce successful results; but with these a power of steam could be had which would doubtless produce some effect upon the soil. But we will come to combinations of this kind afterwards, among different inventions; at present, let us confine our observations to the proposition before us.

The inventor's first idea appears to have been a combination of horse and steam power, the former to perform the work of traction; and the latter, that of digging or breaking up the soil by means of rotary tillers. To carry out this idea horses are yoked in front of the carriage carrying the engine, while steam works the tilling apparatus behind analogous to that subsequently adopted by Mr. Hoskyns already described. In his first patent, the carriage, as our

readers are aware, is borne on four wheels; in the second, on two. In the former, turning at the headlands was doubtless attended with some degree of difficulty; but in the latter, the two wheels running loose upon separate stud-pins, or a bent axle, such is removed. In the first patent, again, the tilling apparatus and frame in which it works can be detached at pleasure, and a reaping machine put in its place, or the engine used in thrashing, pumping, &c. In reaping, the horses are reversed, and push the machine before them. In both patents, a roller behind the digging machine regulates the depth of culture, and between the tiller and it a levelling or drilling-board and sowing machine operate; the former levelling or drilling the newly broken-up soil, and the latter depositing the seed immediately before the roller; so that the whole work of digging, levelling or drilling, seeding, and rolling is finished off at one operation or going over the ground.

The boiler, engines, and machinery are constructed on three separate and distinct plans. In the first, the two cylinders are vertical at the side of the boiler, the latter being placed on one side of the carriage, to allow them room to work on the other; in the second, one is placed on each side of the boiler, acting horizontally and longitudinally, the two crank shafts communicating rotary motion to the tiller working vertically at each end of the tiller shaft, the bottom on a footstep-bearing, and the top a collar; and in the third, the two cylinders are placed horizontally and transversely in front, oscillating vertically or otherwise, and communicating motion to two crank shafts, one at each side, extending backwards literally the whole length of the machine to the tilling apparatus, supported by means of plummer blocks bolted to the outside of the framing, with a footstep-bearing at the lower or tiller end. At this end of each shaft, a bevil pinion gears through an opening in the side frame into a corresponding one concealed in the end of the digging cylinder, so as to be out of the way of dirt. Of the three, the last is the simplest, and freest from complication.

The tilling apparatus in the first patent has some distant resemblance to a hay-making machine. On a shaft is fixed a number of discs, and on these are bolted transverse bars, carrying picks, or forks, or spades, or, in short, any sort of digging tool the character of the soil may require. In the second, a metal cylinder is keyed upon a transverse shaft. Upon this cylinder are bolted radiating arms, so many at each end, and an equal number in the middle; thus forming three bearings for the diggers. On the extreme ends of each series of three arms are screwed or rivetted the digging-bars or spades, extending spirally from the one end of the cylinder to the other, or from the middle arms backward to each end, so as to avoid a bumping action against the soil. As a whole, it very much resembles in appearance a large cylinder chaff cutter, the action of the diggers against the soil being that of the knives of the chaff cutter against the straw or hay, the sharp edge of the diggers entering the soil like a spade. Again, the arms bolted to the metal cylinder may be removed, and curved picks, mattocks, &c., bolted spirally around its circumference in their stead, should such be preferred, all of which contrivances bears a close resemblance to Bonser's and Pettitt's screw plough of 1846.

Such is a very superficial glance at the principal features of Mr. Romaine's proposition. It certainly says much for the progress Canada has made in mechanical science, and the laudable spirit her colonists are manifesting to keep pace with the mother country in the march of improvement. That it has its shortcomings, as we shall now briefly show, is only what is reasonable to expect at the present state of things; but that it developes principles of the highest merit, which will be adopted with subsequent improvements, is equally plain.

Mr. Romaine's machines are subject to almost all the objections already brought against Mr. Hoskyns's, while the yoking of horses and steam together is certainly not putting a very high estimate upon the mechanical power of the latter and expenses of the former. The cutting edge of the digger of the Canadian, from entering like a spade, would no doubt have a less injurious effect upon wet clay soils than the mortar-working tiller of its English rival; but still this is only a question of degree, for the cutting of wet clay soils into ribbons, so to speak, is not the most promising plan either for autumn, winter, or spring culture. In this respect we readily grant that Romaine's digger imitates more closely the action of the claws of a mole than does Hoskyns's tiller; for talpa's claws, like those of all burrowing animals, are so curved that their points enter the soil like a miner's pick. Nature was too perfect a machinist to fall into the mortar-working abrading blunder in designing this "tiny" cultivator of the soil. The principle here involved may no doubt be brought to bear upon wet clay soils in preference to abrasion, if not upon sun-baked clay soils also, with intermittent action. The provision for removing one part, and attaching another, to do all the different kinds of work upon a farm, with one engine, is also a step in the right direction. But these are all subject as yet to much improvement before we can hold out to our readers or the inventor any prospects of success in the field. Of this, however, afterwards, when we come to discuss combinations.

USHER'S PROPOSITION.

Mr. Usher's Patent Steam Plough, as our readers are aware, is upon the rotary principle. His patent is dated July 18, 1849, and the enrolment of his specification, the 10th January, 1850; so that no printed specification exists under the new statute. This is to be regretted, as the invention, with all its imperfections, possesses several points of merit superior to any of its rotary rivals. Justice, however, in this respect has been done it by the *Mechanics' Magazine*, of January 26, 1850, which gives a side elevation and plan of the steam engine, carriage, and ploughing apparatus, &c.

In the language of the above periodical, our proposi-

tion is thus enunciated:—"This invention consists, firstly, in mounting a series of ploughs in the same plane around an axis, so that the ploughs shall successively come into action; and, secondly, in applying power to give rotary motion to a series of ploughs, or rather instruments for tilling the earth, so that the resistance of the earth to the ploughs or instruments, as they enter and travel through the earth, shall cause the machine to be propelled."

The ideas here expressed both of culture and propulsion are plausible, but wanting when we come to reduce them to practice; at the same time, some important principles are involved which may yet successfully be carried out, as the inverting of the furrow slice or spit.

The proposition of culture is with a series of ploughs (say three) on a rotary axis, each to turn a furrow downwards, in traversing the cycloidal course which its predecessor describes, thus turning three furrows at each revolution of the series. If we suppose these curved furrows six inches deep, then the progressive motion of the machine would be eighteen inches for every revolution of the three ploughs, so that, with a breadth of eight inches, the result would just be a superficial foot cultivated, or one acre to each series for 43,560 revolutions, 8¼ miles; or five series of ploughs, at 2 miles per hour, would plough ten acres in 8½ hours.

This mode of ploughing bears a close resemblance to that of working the caschrom, or Highland plough, yet to be seen in some of the stony and mossy grounds of the Hebrides, where the common plough cannot be yoked. With this primeval instrument the Hebridean ploughman goes backward, with the ploughed land and open furrow on his right or left (according as he is "right-handed" or "left-handed"), driving his plough slantingly into the ground with his foot, and turning over spit after spit as he proceeds backward, the lower part of each spit turned over overlying the upper part of the last or previously-turned one.

Just so is the *modus operandi* of Mr. Usher's steam plough. As the ploughs revolve behind the machine, they enter the soil slantingly in the opposite direction of their progressive motion, each turning over its furrow upon that of its predecessor, the surface part being placed in the bottom, and the bottom part turned to the surface.

This is all very well upon paper; but in the field we are afraid the patentee has as yet experienced some difficulty in turning the lower part of each furrow upon the highest part of the one previously turned. It will readily be granted, however, that there is nothing impossible in this with intermittent action, nothing more than what a Highland ploughman easily accomplishes with his caschrom, so that there is no reason to despair of ultimate success. To every reader who comprehends the facts of the case at issue, it must appear manifest that, were this accomplished, the problem of steam culture by rotary action would be advanced a stage if not fairly solved, so that the inducement to progress is great, and the prize held out to invention no empty one.

The other proposition of propelling the machine forward by the action of the ploughs is surrounded with greater difficulty. A very cursory glance at the facts of the case will show this; for, in the first place, the lighter and softer the soil, the less reaction and the greater resistance to progression on the part of the wheels; and, in the second place, progression is impossible, so long as the ploughs are in the ground, owing to the bottom of the furrows, or unploughed land, being always opposed to them from their retrograde movement; hence reaction is *nil*, and even worse than *nil*, as it compresses the heel of the plough more firmly against the solid soil in front, thus acting on each series like a brake on the wheel of a railway carriage.

We have here then two valid objections—the progressive action of the machine, and the reaction of the ploughs—facts too palpable to require further proof. Rotary action, therefore, with continuous progression, is altogether a mistake, as we previously proposed shewing in this place. It is no less amusing than instructive to see how Inexperience writhes upon the horns of this dilemma, brandishing all the missile weapons which "logic" can bring to his assistance; but in vain. The wiser course is to leave questions of this sort to Experience, the best instructor in all cases; for doubtless he will yet teach every one who doubts her prerogative that logic is one thing, and agricultural mechanics another. The practical and more profitable question is, to point out how both objections may be removed.

Intermittent action though slow would obviate the first, the continuous pressure against the unploughed land, similar to what it does the "feed" against the knive in chaff cutting. This is the action of the Hebridean ploughman; and, therefore, Mr. Usher must learn another lesson of the Highland plough. The second cannot be obviated, but it may be lessened to a minimum, by reducing the angle of the wedge. To apply the dynamometer to rotary ploughs, to test the force of traction, may be experienced a more difficult task than to rectilinear ones; but the idea will readily suggest to our readers the practical question at issue.

Such is Mr. Usher's proposition. In its present state, although we cannot award it success in the field, it would yet be contrary to fact to pronounce it a total failure; for, with soil and circumstances so varied, many of its details possess promise of subsequent adoption. Like Mr. Hoskyns's, the patent has added its quota to the progress of steam culture; so that to deny the patentee credit for this would be acting dishonestly towards him—treatment but too commonly experienced by unsuccessful inventors.

This "do nothing" mode of treating inventors, the pioneers of mechanical and chemical science, merits a more candid exposure here. It has of late, for example, become fashionable in high places to condemn all patents not successful. To use strong language, which we hope our readers will not misunderstand, the inventor's patent, which only gives 10 per cent. of success, they heartlessly condemn, looking upon the luckless man as a fool, and his labours as obstacles in the way of progress! If a second gives 20 per cent., its doom is also written; a third, 30 per cent., shares the same fate; a fourth, 40 per cent.; a fifth, 50 per cent.; a sixth, 60; a seventh,

70; an eighth, 80; and a ninth, 90—are all born under the same planet, and treated with the same condemnatory spirit! And when the fortunate tenth inventor appears, with his cent. per cent., What, may we ask, do they give him for his trouble? Only 10 per cent., at the utmost! pocketing the 90, the proceeds of the toil and ingenuity of the nine unfortunates, with, in too many cases, all that they possess besides, turning them and their families adrift upon a cold and heartless world as the maniacal outcasts of society, unworthy of confidence, place, or protection. Conduct so selfish and ignoble as this requires no refutation. Some of the early patentees, as Chapman, Reynolds, Upton, M'Rae, and Saxton, subsequently noticed, may be beyond the reach of reward; but we hope Usher, Osborne, and others will yet receive at the hands of the public more than empty thanks.

THE MESSRS. FISKENS' RIGGER STEAM-PLOUGH.

"Soon shall thine arm, unconquered steam! afar
Drag the slow barge, and drive the rapid car."
DARWIN.

Fiskens' project is a compound of several old ones; some of them patented, others not. In order to do justice to inventors and patentees, whose interests and rights are thus involved, it will be necessary to take a retrospective glance at the whole from the commencement.

The proposition of steam culture, although only just now being solved, is yet coëval with that of steam carriages, both having been enunciated about the same time, and as doubts have arisen as to who was the first inventor, the prize has, rather with more grace perhaps than truth, been given to the poet Darwin, whose well-known lines we quote above.

Mr. Watt's attention was drawn to the subject at a very early date, viz., in 1759; and in his patent of 1784 he specifies *the propulsion of land carriages*, a very comprehensive claim. Then followed Trevithick and Vivian, whose steam omnibuses, no doubt, some of our readers have seen running on the roads about London.

In 1812 the Messrs. William Chapman, of Durham, and E. W. Chapman, of Wallsend, Northumberland, took out a patent for a rigger-carriage working on a stretched chain or rope, secured at both ends by anchors, as now proposed by the Messrs. Fiskens. It was worked for some time on a railway, but was obliged to be given up, owing, it is said, to "the waste of power arising from the excessive friction of the chain or rope." The steam-carriage, weighing 6 tons, had a traction power on the rails of 56 tons up an inclination of 46 feet in a mile. About this time several propositions were made of carting, ploughing, &c., by means of rigger traction, partly under this patent, and partly not; but its failure, from the above, and other reasons subsequently noticed, threw cold water on them for awhile.

In 1816 Mr. Joseph Reynolds took out a patent for a steam-carriage for ploughing, carting, rolling, drilling, threshing, &c., the former being on the traction principle, as now proposed by Boydell, but without the endless railway, he having broad roller wheels, as subsequently adopted by several patentees. Endless railways, however, were soon proposed in endless variety, but failed. There is a good deal of ingenuity about Reynolds' patent, deserving of notice; such as the reverse action of the wheels, enabling the carriage to turn on an area of its own length. It is only to be seen in the Rolls Chapel, from whence we take the above.

Between this time and the date of our next notice large sums of money were spent in the construction of steam-carriages for common road purposes by Hancock, James, Gurney, Gordon, Griffiths, and others, whose inventions we cannot notice for the want of space, although they contain various important links in the chain of progress, as housed engines, &c. The "Happy series" cost, speaking from memory, upwards of £30,000; and every newspaper and periodical in the land at that time teemed with propositions on road-traction, steam culture, &c.

In 1833 Mr. Joseph Saxton, of London, patented his "differential pulleys," or riggers, for working on an endless rope over two anchored pulleys. The patentee adopted several very ingenious plans to obviate the friction of the ropes, which had proved fatal to the scheme of his predecessors, the Messrs. Chapman; but the project not turning out successful, as might readily have been anticipated, was dropped. Many improvements were suggested; but the specifications being comprehensive and grasping in character, nothing was done beyond fireside gossip at the "farmer's ingle" and newspaper speculation.

In 1837 Mr. Upton, of Surrey, took out a patent for steam boilers for agricultural purposes, as ploughing, harrowing, &c., on the traction principle, or rather rolling-stock principle of traction, as proposed by Reynolds. The specification of this has been printed, and may be had at 25, Southampton-buildings, London, by remitting the No. 7458, date 1837, and price 9d.; and to this source we must refer for further information.

In 1839 Alexander M'Rae, of British Guiana, the next in the order of succession, took out a patent for steam culture by means of a portable engine, endless rope, the necessary anchorage, and two series of ploughs in a frame, one for ploughing up the land, and another down, as adopted by the Messrs. Fiskens of late. The invention was principally intended for the low level lands of Guiana, intersected at short distances with a net-work of canals. Accordingly the steam-engine was placed in a punt or barge at one side of the field, and the anchor with its pulley in another at the opposite side, the two sailing up and down as the work of ploughing or harrowing progressed (*Repository of Arts*, vol. 14, new series, p. 212, a drawing and description given).

In 1846 John Tulloch Osborne took out the next project, somewhat similar to the above, the difference being that he used two portable engines on two portable railways at a short distance from each other, as 100 or 200 yards, with two separate plough-carriages; the one being pulled the one way with a single rope on to a drum by the one engine, while the other was drawn the opposite way by the second engine, thus ploughing up

the land into narrow ridges, a ridge at each shift of the engines, or with a long frame at each engine and pulley-guides for the ropes off the drums, a ridge in breadth equal to its length (*Mechanics' Magazine* vol. 46, p. 97, or No. 1,225, Saturday, January 30, 1847, drawings and description). We should also have mentioned that in level fenny land, with ditches or canals, such as would carry punts, Mr. Osborne puts a steam-engine in each at opposite sides of the field, and that his plough-carriages lay down the return rope or chain in its proper position—a most important step.

In the same volume and number of the *Mechanics' Magazine* we have drawings and a description of Bonser and Pettitt's patent screw plough, patented the same year, for steam or horse-power. It consists of a shaft or drum with radial cutters or prongs or tines, either straight or curved, attached thereto at right angles, and arranged round it spiralwise.

Six or seven more follow, of minor importance to our present purpose, but yet possessing valuable parts ; all of which we must pass over hurriedly, merely glancing at principles, name of patentee, number and date of patent, and the works where an account of them will be found.

George Calloway and Robert Allee Purkis, No. 12,860, date 1849, *Mechanics' Magazine*, vol. 52, p. 437. A triangular frame supported on a carriage with ratchet-wheel at each angle, round which are passed a number of pitch-chains, fitted on the outside with ploughshares. Motion is communicated to the ratched-wheels by a locomotive. Paul Rapsey Hodge, No. 13,159, date 1850, *Mechanics' Magazine*, vol. 53, p. 478. Weston Tuxford, No. 13,168, date 1850, *ibid*, vol. 54, p. 38, and *Patent Journal*, vol. 10, p. 210. George Thomson, No. 13,222, date 1850, *Mechanics' Magazine*, vol. 54, page 137. A crank-shaft digging machine, with apparatus for turning off the spadefuls when lifted by the diggers. George Guthrie, No. 13564, date 1851, *ibid*, vol. 55, p. 278. A forking machine. Claims :—1, General arrangement of forks ; 2, mode of turning them by a screw travelling slide ; 3, use of guides for directing the forks ; and 4, system of digging and turning the forks. David Stephens Brown, No. 13,757, date 1851, *ibid*, vol. 56, pp. 277 and 301. Revolving blades or cutters. And the last we shall notice is the patent of Martyn John Roberts, No. 13,948, date 1852, *ibid*, vol. 57, p. 122. A rotary forker.

These we have taken principally from Mr. Woodcroft's valuable "subject matter" and "reference" indexes of patents, and partly from the *Mechanics' Magazine* and *Engineers' and Mechanics' Encyclopædia*, &c., in our own library ; and if our readers have been able to follow us, they must perceive that the Messrs. Fiskens cannot patent very much of their proposition, from its being a compound of old inventions. There is, however, sometimes nearly as much merit in this as in the production of the originals, and we should be sorry to deny them one iota of what is their due ; at the same time equal-handed justice demands the same line of policy towards the original inventors, whose names we have mentioned. It is long since we had the pleasure of thanking Her Majesty's Commissioners of Patents for a series of specifications of patents for reaping machines, and at the present time we have no doubt the agricultural interest would return them double thanks for a series on steam culture and common-road locomotion. They are entrusted with a very weighty responsibility in the supervision and control of the progress of chemical and mechanical science in the first kingdom of the world, and we believe are more than desirous to study with special anxiety the prosperity and interest of agriculture —the *parent art*. But to our point, a review of the Messrs. Fiskens' proposition.

Their method of culture is ploughing by rectilinear action, both the motive and traction power being applied on the rigger principle first patented by the Messrs. Chapman, M'Rae, and Saxton, whose patents have already been noticed. Rotary cultivators, however, may easily be placed in the rigger-carriage frame, as proposed twenty years ago, or drawn behind it. As yet we have only heard of its being constructed for ploughs, and these have been worked both by a water wheel in Perthshire, and a portable engine at Carlisle.

The tilling implement itself is a one-way ploughing machine, similar to Mr. M'Rae's, having one set of ploughs for working upland, and another for coming down, each set or series being adjusted at the headlands by means of levers, both working in a framed carriage.

Motion is communicated to it by means of an endless rope and two riggers, or drums ; the one we shall term the traction rigger, and the other the driving rigger.

A strong wire rope (double the strength of that required by McRae, or where an endless rope is used) is stretched between two anchors, at the opposite headlands, taking one turn round the traction rigger, according to the patent of the Messrs. Chapman, noticed. This rigger, when actuated by the other and the necessary intermediate gearing, rolls along the wire rope from end to end, like the drill stock or rigger of a common drill bow along its cord. On the shaft of this rigger is a large spur wheel, which gears in a small pinion on the shaft of the driving rigger, the two having an increase of lever power, with a corresponding amount of speed and friction.

The driving rigger is actuated by an endless rope passing over the motive-pulley of the engine (supposing it to move along the headland) and guide-pulley at the anchor of the opposite headland, one side taking a turn round the rigger as it passes the implement, as was proposed under Saxton's patent, in 1833, and improvements at that time recommended ; or the engine may be stationary, with a second driving rigger, pulleys, and anchors on the headlands.

A sort of subsoil plough anchor, drawn across the headland as the ploughing advances, by means of an anchor at the farthest end, and tackle is used. It consists of a thin plate of iron something like the coulter of Fowler's draining plough, or a subsoil plough, and in length according to the number of ploughs it has to anchor.

Such will convey to those of our readers who have not seen the rigger plough a general idea of its construction and method of working. At first sight the whole is very ingenious, exhibiting means capable of performing certain results with undeviating accuracy, and therefore liable to impress upon the minds of superficial observers the idea of success ; but those who are familiar with agricultural mechanics during the last half century, and who are capable of comprehending the facts of the case at issue, must readily perceive that many difficulties,

some of them all but immoveable, must be got out of the way before such can be attained—such as the shifting of the traction rigger rope in drilling or ridging for turnips over a convex surface, and working the driving rigger over a concave. In saying so, it must not be assumed that we are willingly throwing opposition in the way; quite the contrary; for our object is to guard parties against being led astray, and involved in a profitless expenditure, lest experience find them in a greater blunder than many a patentee has found himself when he came to the testing point of reducing to practice his golden opinions under the auspices of her Majesty's letters patent.

The merit of the implement is of a twofold character:—first, a less power it is said will work it with the tackle than without it; and second, the plan of anchoring is superior to that of pits, as proposed by others, even although the strain upon the anchors is greater.

The gain of power, in the first case, is at a serious sacrifice of time and friction, especially in wet weather, when sand rises with the rope; and although small farmers may have to submit to this, supposing no better system in existence, the practical question resolves itself into this—Whether should the increase of power be at the implement or engine? One party advocates the former, another the latter—which is right?

With so many rivals in the field, we must leave experiment to settle questions of this kind. It would be highly reprehensible to do otherwise, for practice must always test science. All that we can prudently do is to point out the facts of the case on both sides, so far as known.

In the first place, then, the rigger plough is more expensive at first, there being a greater weight of rope and more complicated machinery for working it than in the case of Osborne's plan; while the extra tear and wear upon the driving rope, especially in wet weather, when it is continually grinding on the drums, is greater than the increase of power gained indicates, as is also its weight or strength. The wire rope of the traction rigger, for example, as we have already said, is equal in weight, or nearly so, to that of the endless one; while the friction from rigidity in going entirely round the traction rigger, and grinding action of the rope in passing where it is double, greatly exceeds that on both the headland pulleys in cases where an endless wire rope is used, with a slow motion, if not including the friction of the wire rope inself. We have, therefore, more than the friction of the driving rope extra, with all the tear and wear upon it from its extra velocity and working round a rigger; while it is a well known fact that the strength required to support this extra velocity and grinding action of the rigger is greater than the power gained. It is impossible to estimate the tear and wear upon the ropes by the two riggers, in the absence of a lengthened experiment with the dynamometer to test the tension; but every machinist is well aware how short a time the cord of his drill bow lasts when kept in constant use, while it is a well known fact that Chapman's patent failed on this very point.

In the second place, again, the force of traction required to overcome the friction of a heavy wire rope, on the ground, as in McRae's, or Osborne's, or Williams's case, leaving out of consideration the driving rope, is avoided.

To do Mr. Williams justice, however, we must here observe that it is not yet known how he may yoke his implement to his engine; as at the May meeting of the London Farmers' Club he rather quaintly told his audience, in answer to this question, that he had only that day taken out a patent for it, and of course could not tell! So long, therefore, as we see many ways by which the friction of the wire rope, drawn over the ground, can be reduced, if not altogether avoided, it is but fair to preserve a respectful silence, until we get his printed specification.

So far, therefore, as we have yet attained in the march of progress, the real question at issue lies between the weight of Fisken's driving rope, multiplied by its velocity, and the weight of McRae's, Osborne's, or Williams's driving rope multiplied by its velocity, together with the friction of the riggers and pulleys respectively, with the tension of both the rigger ropes. At Carlisle nothing was done towards testing the force of traction of Mr. Fisken's implement by the dynamometer over that of two ploughs on the same soil; nor are we aware that Mr. Williams has done any thing to obtain the difference between his implement and his common ploughs. Were we in possession of facts of this kind we should have allowed them to speak for themselves, but as we are not, have no alternative but to postpone the matter to Chelmsford, in the hope that dynamometers for steam traction will be forthcoming there.

With regard to the next topic—anchorage—the increase of strain upon Mr. Fisken's anchors is just double the power applied to his tackling, to which must be added rigger friction, in combinations of levers of the first kind. The proof of this is simple, for the anchorage of the wire rope is the fulcrum which sustains the weight (W), or ploughs on one end of a compound lever, while the driving rope or engine acts upon the other over a pulley, whose anchor forms a second fulcrum sustaining twice the power (P). The first fulcrum thus sustains twice W, the second twice P, or twice the power more than in the case of Mr. McRae's system, and more than double that in Osborne's, whose engines are his anchors.

But the superiority of the anchorage, it may be said, in a practical sense, does more than compensate for this loss, going far to obviate altogether the principal objections to projects based upon this foundation. Into the details of proof of this kind here our limits will not allow us to enter, but from what has already been said, our readers will perceive that the digging of pits as practised by Mr. Fowler in draining is avoided. The fact is that when we come to discuss combinations in connection with practice, we shall find all stationary anchorage of this kind objectionable for general use, being only adapted for exceptional cases, and even then Osborne's engines with Boydell's endless railway may carry the prize, were both placed opposed to each other in the field. We may be allowed here to express a regret that Osborne has gone to the West Indies, leaving no one to manage his patent.

Owing to the darkness which prevails on this subject relative to the novelty of the invention, its general merits and efficacy in the field, let us review a little more in detail, first, the Carlisle experiment, how far it corroborates the above conclusion; second, the mechanical data by which results are arrived at; and third, what prospects there are of Fisken's combination of riggers being generally received.

1. At Carlisle, the lands having been newly ploughed, the draught of the two ploughs must have been light for four horses. Three horses were probably nearer the truth; but give the odds in favour of the inventor, and say the resistance of the implement, or ploughs, was equal to the draught of four horses. The pressure of steam, again—the moving power—we are informed, was only 8 lbs.; say, for the sake of easy calculation, one-horse power or draught, while the velocity of the one to the other, or the lever power, was as 11 to 1. Now, 1 horse acting with a leverage of 11 to 1 would produce the effect of 11 horses; so that the draught of the ploughs plus the friction of the ropes would be equal to that of 11 horses, and the strain upon the anchors equal to that of 13 horses—11 at one headland and 2 at the other, supposing the full force

of the engine or horse communicated to the driving rigger and anchors. This, however, is not the case, part being wasted in friction; hence the tension of the wire rope would be less than the equivalent of 11, thus confirming the general conclusion given above, that in Fisken's arrangement of Chapman's and Saxton's riggers with McRae's ploughs, the tension of the wire rope is equal to twice the draught of the implement or ploughs, and the strain upon the anchors twice the power applied plus this tension.

Reversing the above, and supposing what is not true—for the friction of the rope upon the drum of the traction rigger is always equal to its tension—but overlooking this fact, as too many have done; supposing, we repeat, that this friction of the wirerope is nil, and that the fulcrum thrust of the axle of the driving rigger, and friction of the rope, also are nil; then with a power of 11 to 1, or rather 1 against 11, the traction force of the driving rope would only be 4-11ths, or little more than the draught of one-third of a horse, an absurdity too gross for the most unlettered rustic swallowing, although a bold attempt is now being made to cram it down his throat.

2. The diameters of the rigger, drums, spur-wheel, and pinion have not yet been reported—at least so far as we have seen. All that we are told is, that the radii of the drum of the driving-rigger and radii of the small pinion on the same axis act as levers of the first kind, and those of the spur wheel and drum of the traction rigger either as levers of the first or second kind, according as the rope is put upon it, and that the two between them have a gain of lever power equal to 11 to 1. We are told, however, that the drum of the driving rigger is "a large wheel;" let us therefore suppose the gain upon the driving rigger. The former example with levers of the first kind we have already given; we have, therefore, only to notice the latter.

According to this arrangement (and we may warn our readers in time that it is a bad one), we have one-horse power on the long end of a lever of the first kind, supporting half the draught of the ploughs on the other, and, consequently, the axis of the driving-rigger has either to sustain the whole draught of the ploughs, it being the fulcrum, or this draught has to be added to that of the implement, thus doubling its draught; but if you double the draught of the implement, you double the friction of the rope around the rigger drum. In short, various lever combinations may be adopted, according to the mode of putting the ropes around the riggers and yoking the engine, to illustrate which a diagram is necessary; but as all of them are worse than propositions long ago enunciated—while greater than they can be made—as shown in the next paragraph, such would be superfluous.

3. In its present shape, Fisken's plough is inferior to Osborne's. It is capable, however, of great improvement, but not, we fear, without a license from Mr. Boydell and the above patentee in the field before him; and if the latter adopts Chapman's rigger, which he is perfectly entitled to do, he will still retain the lead, granting that rigger traction shall be proved practicable—more than has yet been done; so that if we are bound to give credit to whom credit is due, we have to thank the Messrs. Chapman, McRae, Saxton, Osborne, and Boydell, and not Mr. Fisken, who, instead of strengthening the weak parts of former inventions, has unfortunately done the very reverse. With regard to the question, Can Osborne supersede Boydell? Osborne requires the endless railway both for his engines and plough carriages to make his invention complete. And with regard to the rolling stock system *versus* stationary engines, practice, and practice alone, can answer that question. Nothing can be more premature and imprudent at the present moment than for agricultural writers to deal in wholesale condemnation with everything which does not chime in with their own opinions, or for the conductors of scientific journals to allow matter of this kind to fill their columns, as it damps the spirit of invention, and checks the progress of science in connexion with steam culture.

EXPOSITION UNIVERSELLE DE L'INDUSTRIE.

[FROM THE FRENCH OF MONS. VICTOR BORIE, IN THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Chapter III.—Trial of the Ploughs.

We spoke in our last number of the desire which was manifested by the Agricultural Jury to test such instruments on the soil as could not be fully appreciated in any other way. The President of the Imperial Commission immediately occupied himself in taking the necessary measures for transferring the instruments to a farm in the environs of Paris, where the Jury could see them work. Mons. Dailly, the Paris Postmaster, and a Member of the Agricultural Jury (of which Count Gasparin was the President), offered to place the fields of his vast domain of Trappes at the service of his colleagues.

Accordingly, thirty ploughs, two sowing machines, and some ground-cleaning and hay-making machines, &c., were sent to Trappes, and were deposited, on the 7th of July, in a large field near the high road. Four vigorous teams, consisting of a pair of horses each, had been provided by Mons. Dailly (who did not omit any of his wonted hospitality), and at nine o'clock the Jury were on the ground and the instruments began their work. A very large number of persons had been associated with the members of the Jury, to assist in these interesting experiments. Besides the Count Gasparin, the Baron Riese Stalbourg, and Messrs. Amos, Dailly, Barral, Moll, Robinet, Yvart, Herve Mangon, Trescat, Trélat, Denison, Wilson, Leopold de Mathelin (all members of the Jury), we observed the owners of the instruments on trial, several distinguished agriculturists, Messrs. Howard, Busby, Ball, Ransome, Hornsby, Gurbal, Bella, &c., and the commissioners from several foreign countries, among the company.

The English makers had brought both their mechanics, their labourers, and interpreters along with their machines, and the labours of the day commenced with Ball's plough. The ploughs had to make at first two furrows, going and returning without it, and then two other furrows in the same direction as the first, with the dynamometer. The three dynamometers which figured in the Exhibition—that of General Morin, that of Bentall, and a Danish one—had to be brought on the ground. General Morin's was first applied to Ball's plough, but it did not answer its purpose. This instrument, de-

prived of its fore-wheels, weighs about 30 kilogrammes, and hence this enormous weight, placed on the fore part of the plough, caused it to lean forward, and obstructed the progress of the ploughshare, in spite of all the efforts of the labourer who guided the handles. Such counterpoise militated moreover against a proper appreciation of the force expended, seeing that it considerably augmented the draught. These inconveniences had already struck all the spectators, when at the first turn of the plough one of the plates of the dynamometer broke, and recourse was had to Bentall's. This instrument is not yet complete, but it requires very little alteration to make it so.

In its present state, it was supported on a small four-wheel truck, which makes the use of it comparatively easy. The cylinder, on which is placed a sheet of white paper, is moved by a strong iron-wire spring, and the pencil, which is fitted with an endless screw, traces horizontally the line which serves to calculate the force expended.

As for the Danish dynamometer, it could not be used for an instant. Its exhibitor was not present, and no one could appreciate those qualities which appeared, as far as the others were concerned, of a very mediocre stamp. Each furrow made by the ploughs measured 220 metres. The teams were followed by a member of the Jury, who measured at stated intervals the depth and size of the furrow. This operation is commonly effected by the aid of an English instrument of very simple construction, and very easy to handle. It is a sort of measuring machine, like that which is kept by the Councils of Revision to measure young soldiers, but exactly reversed. They apply it on the edge of the furrow, and press the measure, by means of a groove, to the very bottom of the furrow. The sliding rod leaves exposed, close by the hand, the figure which marks in centimetres the depth of the furrow.

The English ploughs were handled by English labourers, brought by their proprietors. M. de Mathelin, the Belgian Member of the Jury, with a devotion for which all his compatriots ought to feel themselves deeply in his debt, handled in person all the ploughs in his part of the Exposition, while MM. Dailly and Bella sent excellent labourers to work the rest.

The majority of the ploughs were freshly painted, which added to the charm of the general *coup d'œil*, and gave each instrument a most seducing look. Unfortunately, this holiday suit slightly obstructed the facility of working them. In the Scotch meetings it has been forbidden by the common consent of the competitors to bring painted instruments into the field — a measure which seems to us by no means ill-judged.

Mr. Ball's plough presented the same results which have been generally obtained from all English ploughs. The furrow is clean and regular. The furrow-turner is of very great dimensions (that of Busby's plough being 1 metre 65 centimetres), and the soil is thrown to the left with perfect regularity. Nevertheless, this quality becomes a stumbling-rock in certain strong and damp soils, as the furrow-turner smooths the soil, and hence produces clods, which harden in the sun, and are so difficult to crush. Our agriculturists consider this smoothness of tilled soils a disadvantage, but the English ones are not of the same opinion, and look upon this regularity as the sign of work well done. It is their custom to give after the tillage one or two workings to their ground, which allows them to break these clods easily, either with a scarifier or a harrow.

After Ball's plough—which only accomplished a 14-centimetres depth of furrow—Busby's plough was tried. Its maker had brought with him an English labourer, who worked it with remarkable skill. This plough cuts furrows of 16 centimetres in depth by 27 in width. We remarked in it the same regularity and smoothness of working as in that of Ball. This plough, which does not appear to be of heavy draught, is cleverly worked by a pair of horses. At intervals the labourer leaves hold of the handles, and the instrument continues at its work for 8 or 10 metres with exactly the same precision. It is sold in London at 112 francs, and is entirely of iron.

They next brought the plough No. 2, made at the Grignon manufactory of M. F. Bella. This instrument is of wood and iron, and costs the modest sum of 25 francs. It is designed for such lands as only require very light labour, and worked to the entire satisfaction of all present. Its draught is very considerable, as it penetrates to a depth of from 14 to 16 centimetres, forms a regular furrow, and cleverly breaks the earth, which is turned up at an angle of 45 degrees. What is most remarkable is the simplicity of its regulator. It is sufficient to press sideways or vertically on the stock of the regulator, which has a special arrangement to attain the desired penetration.

After the Grignon plough, a trial was made with one called "The Geometric," from the workshops of Mons. Barrosch, of Prague; but we know no good reason why it should be so named. This instrument seemed rather heavy. The furrow-turner, which is 87 centimetres in length, turns up a good quantity of soil well broken. Unfortunately the furrow is not regular, and the ploughshare always leaves behind it some hollows and unevennesses. The furrow is deep, and measures 17 or 18 centimetres in depth by 25 in width. Judging by the dynamometer, the draught appeared considerable in comparison with the other ploughs. The plough of Mons. Buickmann, of Blaesvelt (Anvers), which was entered among the Flemish ploughs, offered some very good results. It turned over and crushed the soil well, and its furrow, which is very regular, goes as deep as 18 centimetres. The length of its furrow-turner is 90 centimetres. The only inconvenience which we could find in it is the too great waste of force which follows the movement of the furrow-turner, which throws up the earth rather too much. The labourer is frequently obliged to leave the plough on the right side, in order to clear the soil from the furrow, which shows a deficiency in the furrow-turner. This plough costs 120 francs, and is made of great solidity in wood and iron. The Howard's plough was the subject of a long scrutiny. This instrument, which is already well known to our readers, has produced most satisfactory results. The furrow is clean and regular, and 15 or 16 centimetres in

depth. The soil is well turned; but the smoothness, which appears to be a specialty of all the English ploughs, is equally to be remarked when this is at work. We wished to examine as much as possible the existence of this inconvenience, which struck almost all the Frenchmen who were present. We have displaced, first with foot and then with hand, most carefully, the particles which seemed compressed or smoothed by the furrow-turner, and with the least shake the clod moved and divided itself with the greatest ease. Hence we have good reason for asserting that the smoothness is quite superficial, and that the earth, in spite of this deceptive appearance, was perfectly divided. We ought also to say that the land on which the operation was made had produced artificial forage, and that the soil was a sort of clay flint, and rather dry. We have no idea whatever what the result would be on a strong and damp soil.

The maker of Howard's plough assures us that it was his intention to construct a plough adapted to a great variety of soils. The experience of Trappes did nothing towards informing us on this head, as all the trials took place in the same field, and on ground, as a whole, exceedingly favourable. We have been enabled to establish by proof that the draught is very much diminished, and that one horse can really draw a plough, built on this model, in soil which is not too difficult.

After all said and done, we see that the conclusion to be drawn from these trials depends entirely on the results which have been given by the dynamometric experiments, in keeping account of the resistance opposed by the quantity of earth displaced—that is to say, making the height and depth of the furrows especial elements from which to calculate the figures of the dynamometer.

The Jury also set to work a Belgic plough of M. Tixhon, of Fléron (Liege), which made a furrow of 17 centimetres in depth by 22 ; an Austrian plough, called Rischaldo, which gave a furrow of 17 by 25 ; a Belgic plough of M. Odeurs, which possessed the peculiarity of a furrow-turner 1 metre in length, like English ploughs, and which traced a furrow of 17 centimetres by 27. The plough of M. Thace, of Brandenbourg, gave less satisfaction, and required considerable draught to trace an inconsiderable furrow of 14 centimetres in depth by 25 in width.

The ploughing tests were brought to a close by a trial of two ploughs equally remarkable—to wit, the plough of Ransome and Sims, of Suffolk (England), and that of Bingham, of Norwich (Upper Canada). The first is entirely made of wood and iron, like all the English ploughs, and the results which it produced seemed most satisfactory, but it appeared to require a little more draught than the Howard plough. Bingham's plough very much resembles the English plough ; it is very fine and light in its build ; the handles are longer than ordinary, which makes the plough much more easy to manage, on account of the length of the arms of the lever.

The opinion of the French labourers and workmen who were there, appeared, on the whole, very favourable to this plough. They were, without doubt, struck by this quality of the instrument, without troubling themselves about the other characteristics of a good plough, which they were not able to discover so easily and promptly. The Ransome plough has a furrow-turner of the enormous length of 1½ metres ; it enters deep into the earth, and its furrow, which is 18 centimetres in depth by 20 in width, is a little narrow.

Chapter IV.

TRIAL OF AGRICULTURAL MACHINES.

The ground-cleaning machine of Mons. Guibal, of Castres (Tarn), was tried on the furrows traced by the ploughs, and worked to the satisfaction of all. This instrument consists of a cast-iron wheel, armed with pairs of teeth, slightly bent, all round the circumference of the wheel, and following in their bend the development of the circle. These teeth, which are about thirty centimetres long, penetrate the soil vertically, and break it fine. Was the ground-cleaner of Mons. Guibal tried on ground favourable to it? We made some observations on the results it presented. We said that it did not throw up the soil sufficiently ; and in fact we found in the furrow some lumps of earth which were not broken, and at certain distances little holes, which had formed as many little reservoirs as if it had just rained. These observations cannot be very definite, as the ground-cleaner was not tried with all the requisites which were rendered essential by the nature of the land and the season. It added nine centimetres to the depth of the furrow ; it is constructed for a three-horse team, and costs 375 francs.

There was also an exhibition of a swing spiked-roller belonging to Mons. Charles Tiquet, of Carcassone (Aude), which bears a strong general resemblance to that of Mons. Guibal. Its price is 440 francs, without taking into account the truck required to carry it to the field, and which costs 60 francs.

The drag-harrow of Mr. Richard Coleman, of Chelmsford, Essex, broke the ground sufficiently well, but it is heavy even for two strong horses, such as M. Dailly's ; and it, moreover, stuffs itself a little, that is to say, gathers up the dry weeds, which get entangled in the machine. Nevertheless, this instrument is very commonly used in England.

We also tried in a field of beetroot the hoe of Mons. Claes, of Lembec (Belgium), which has three triangular and horizontal shares, but the result was not satisfactory. The soil was not well hoed round the plant; and we might feel assured of this by observing the work of the hoers who were occupied on this field at the moment of the operation, and who ironically amused themselves by following the machine, and doing its work over again. In spite of the care which was taken by the driver and conductor of the machine to follow the lines exactly, the least deviation carried away some rows of stems, and heavily damaged the crop. Still this machine, when worked by those who are thoroughly familiarized with the style of handling it, and in a country where the mode of cultivation is specially adapted to its use, might render the greatest service.

M. Claes hoes all his fields of beetroot with this instru-

ment of his own invention, and finds it answer very well.

While the ploughs, the harrows, and the hoes were at work on a part of the property of Mons. Dailly, the hay-making machine of Messrs. Smith and Ashby, of Stamford, Lincoln, was conducted towards an elevated spot. A large crowd of labourers, hoers, and mowers gathered by degrees from the neighbouring fields, attracted by a feeling of curiosity and instinctive hostility towards machines which, according to them, are destined to replace "the arms of man," and to condemn the labourer to die of hunger. This has been their song from time immemorial against machines which are not made their own way—spreading abundance and ease around them, on the workmen as well as the masters. Let them just go, this day, and try to break the Jacquard looms of the weavers of Lyons! Owing to all these circumstances, the present trial was one of lively interest.

It was forthwith decided to make hay in a field sown with strong trefoil, and the swathes of hay were thickened and placed at a sufficiently great distance from one another. The first attempt, which was made in the absence of the owner of the machine, was a complete failure. They had driven it lengthways along a swathe, so that one cylinder took in the swathe, while the other merely passed over a bare space. The consequence was that the wheel immediately choked itself. It was then that Mons. Baron—the bailiff at Trappes, who had lent his most intelligent assistance to the operations of the jury—caused them them to drive the machine across the swathes, after having taken care to depress the cylinders a little.

The hay-making machine having thus received the necessary adjustment, immediately set to work with a rapidity and precision which drew forth loud plaudits from the most hostile. The hay-makers followed jealously in the track of the machine to examine the work which it did for them. "*The hay-rakers won't complain that that hay-field has not been well made,*" was the cry of one of them, as he tossed on the ground a handful of grass, which he had just picked up; while his comrades shook their heads with mingled spite and admiration. We calculated that in less than two hours the machine would do as much work as one man in 21 days. It costs 420 francs, delivered free of expense at one of the stations, or on the London Quay. It is probable that, in a short time, this machine will be universally used in France. Seldom has it been our lot to assist at a trial so wonderfully prompt and successful.

A small horticultural instrument, invented by M. Ledocte, of Belgium, was also brought on to the ground. It was a transplanter, made at the settlement of Mettray. This instrument is composed of two double-jointed pincers, ending in two oblong plates, in the centre of which is a small oval disc. The apparatus is applied vertically to the plant which it is proposed to transplant. The pincers dip into the earth round the plant, while the disc presses lightly above, and secures the root; the pincers are then squeezed, and the plant is raised with a large lump of earth round its roots, and placed in a trough destined to receive it. When the disc is taken out, the two circular pincers are alone left. The instrument thus transformed is of great use in transplanting the double roots of beetroot, before the third tillage, and thus making the rows complete. The pincers are inserted into the place where the beetroot has failed; they then make a trough by removing a little of the earth to one side, and having found a double beet-root, which they separate by placing one of the plates of the instrument between its two stems, they lift it, and transport it, with its clod, to the trough they have just prepared.

We have seen this instrument work in a field of beet-root; it was managed with considerable dexterity by a young man, who worked it for the first time, and it may be said to have perfectly succeeded.

The whole of the trials which were made before the jury excited the most lively interest. We were proud to see, worked by intelligent hands, these ingenious machines, whose great reputation preceded them, and which have all been found worthy of the great success which they have achieved in countries more advanced than ours.

In agricultural progress the English are our masters on all points; they possess what we have always lacked—powerful means of production in their workshops established on a large scale, which enables them to dispose of their machines at reasonable prices. The same machines, made in France, where the value of money is greater than in England, and labour is consequently dearer, would soon be quite out of the reach of all fortunes. When we consider that we pay, including transport and custom-house duty, 50 per cent. more for them than the English, and that their agricultural firms are much richer than ours, we need not be astonished at the difficulty which these novelties have to encounter amongst us. The Howard ploughs, which cost 108 francs in London, are re-sold in France at more than 150. It is probable that, if they manufactured them on as great a scale in Paris, they would not come to more than 80 francs; but the manufacture of agricultural machines has not yet been organized in earnest amongst us, and it has been left to a few isolated individuals to take a slight initiative in this direction.

The trials with the agricultural machines were still far from being brought to a close. They tried on Saturday (July 14), in the Palace of the Exposition, the chaff-cutters and the root-slicers; and in a few days the open-air trials of some of the ploughs and the reaping-machines will be renewed, and will doubtless prove most interesting. The trial of the churns and the dibblers took place on July 19.

We must revert for a moment to the Palace of the Exposition, in order to note some new instruments; three of which, the invention of Monsieur Guibal, and untried, are especially interesting, and cannot be passed over in silence.

The spiked roller of Monsieur Guibal is composed of twelve cast-iron wheels, 55 centimetres in diameter by 5 in width, each armed with eighteen teeth of 12½ centimetres in length. Six of these wheels, forming

half the roller, are made to act together by means of their axles; and it is so with the other six. These two divisions of the roller placed on the same axle can revolve separately, or even in opposite directions, in order to facilitate the process of turning.

The wheels are held together in such a way that the teeth of each form a continuous array with the teeth of the neighbouring wheels. They present also in one line twelve spikes, which makes 198 spikes for the whole roller, which attack the ground scarifier-fashion. The wheels are 5 centimetres in breadth, and are placed at a distance of 5 centimetres from one another, and form a roller, whose size, in order to give it the necessary scope, is about 1 metre 20 centimetres.

This roller is comprised in a wooden frame; and we find it fitted with a pole or double shafts, according as oxen or horses are used to draw it. Eleven brushes are solidly fixed in the rear of the frame, to detach and brush away the soil which the teeth raise with them, and thus hinder all chance of their being choked up.

The two sides of the frame are cut by a sort of sloping saw for a third of their length, beginning from the rear of the frame, where the brushes are fixed. These two parts are forthwith reunited by means of a strong hinge, and hence the rear of the frame works with a swing movement whenever a stone or a resisting body strikes the brushes. These, by the very fact even of this movement, cease to be tangents of the circle of the wheels, and thus thrust aside the obstacles which embarrass for a moment the march of the roller. Two oxen can draw it; and it costs 500 francs. It can also be used for a hoeing roller by simply lifting up the crooked wheels, which correspond to the line of plants they are required to hoe. For maize sown in line they lift the four wheels in the middle, and thus hoe two lines of maize. When the plants are so high that the axletree of the roller can bend and hurt them, they disjoint the roller into two or three hoers, according to the space between the plants. Each of these hoers is drawn by a single horse or ox, which then walks, as well as the driver, between the lines of plants, without touching them. The spiked roller and the hoeing rollers have their handles of iron, which are exceedingly useful for guiding such instruments of draught. The minimum weight of the spiked roller is 600 kilogrammes. This weight may be increased at will, by loading it on the sides or the middle, whenever it works as a hoeing roller.

Among the agricultural products we remarked the show of Monsieur Yver, of Bruchellorie of Theillay (Loire et Cher), who sends the products of Sologne; twenty collections of corn from Monsieur Quillet, the secretary of the Amiens Society; the show of the farming-school of Lavallade (Dordogne), which is composed of grain of different kinds; Norwegian barley; small white and yellow maize; tobaccoes from Corse, Lot, Lot et Garonne, and the north; choice artificial guanoes from Monsieur Edouard Darrien, a pupil of Roville's, from Chantenay (Lower Loire); and, lastly, samples of the most interesting character from Monsieur Vandercolme's, which gave one an opportunity of comparing grain grown in the same field, both before and after draining.

Chapter V.

The exhibition of agricultural implements under the Exposition-shed does not offer any especial novelty. The peasants' hives exhibited by M. Hamet, Professor of Agriculture in Paris, are simple and well-arranged; while the osier hives of M. Poissonnier, of Palaiseau (Seine et Oise), are light as well as elegant, but the swarms would not be entirely sheltered from the cold of an inclement winter in such fragile abodes: and the straw hives appear to us to be superior. They are well finished off; and the tin tube which is attached to the upper floor, and ascends through the top of the roof, is very happily devised for renovating the atmosphere of the hive.

M. Hennebelle, à Moulins, Lille (North), has constructed some hives of wood and clay, on an inclined plane, which are also well arranged.

M. Debauvoys, a doctor, of Seiches (Maine et Loire), and the author of a small work entitled "Guide to the Apiculturist," has exhibited some hives made of wood, with glass fronts. These hives are divided into vertical parallel compartments, formed of the honeycomb itself, which permits the rearers to visit the bees all the year round, to provide for their wants, to get hold of the swarms, and, in short, to perform all those operations which this pursuit demands without the slightest inconvenience whatever. This hive costs 10 fr.

We have also watched with considerable interest the working of a very useful rustic machine, all of wood, designed to make haybands, at the rate of from 180 to 200 an hour, by merely giving it 22 or 24 turns. Its mechanism is very simple, and it costs 20 fr. M. Penu Hellouin, a physician of Calvados, of whom we have had occasion to speak before, is its inventor. We do not know whether he has registered it: if not, the machine is so simple that it would be easy for an intelligent husbandman to construct one, on the same plan, in two or three night-watches.

It is of the very greatest importance not to proceed to sowing without having the grains perfectly cleaned—a precaution which is sadly neglected on account of the difficulty of obtaining grain completely free from parasite seed. And so it often happens that the labourer himself scatters over the field the bad grain, which tends to ruin it. M. Pernollet de Ferney-Voltaire (Ain) has constructed a corn-cleaning machine of cylindrical shape, for preparing the wheat and the rye destined for sowing purposes. It is constructed of iron plates, tinned over, and of half-round iron, and consists of a trough, in which is placed the seed, whose flow is regulated by a slide placed at its bottom; and also of a cylinder divided into four compartments, pierced with holes, each answering by a sort of aperture in the trough to the receptacle, into which each quality of the grain falls when divided by the cylinder. We have seen this instrument at its work, and it produced excellent results. The

corn, when shaken about in the trough, was well mingled; and it arrived at the last receptacle for it in a state of perfect purity. This instrument has already been in use for many years on farms which it has been our lot to visit, and is highly appreciated by agriculturists: it has, in fact, been consecrated by use.

Some plantations had been made in the lands of Bordeaux, but unfortunately not on so large a scale as could be wished. The Exposition is this year destined to satisfy those who have taken the initiative in this productive cultivation of unproductive soil. We have seen some sea-pines springing from seed-beds in the lands of Gironde in 1850, which have attained, so they say, in four years to three metres and a-half or four metres. The wood is perfectly sound, and the thickness is proportioned to the height. The diameter of the trunk is just 94 centimetres. The oaks produced from acorns which were sown about the same period have attained the same proportions. M. Chambrelant, an engineer of bridges and highways, has directed these labours with remarkable talent.

The preservation of wood has become an important problem, and two of the exhibitors have made serious attempts to discover a means of preserving it from the effects of decomposition, from damp and the ravages of insects, when it is destined to remain for a long time under the ground; and both appear to have succeeded. They are M. Jourdan, a professor, near Lyons, and M. Boucherie, a physician. The two processes appear to rest on the same principle, to wit, capillary suction of a preservative fluid into the pores of the wood. The process of M. Boucherie is the more ancient, and has kept the promises it made. M. Jourdan preserves his wood quite simply, by the immersion of the sharpened end for ten days in a solution, a twenty-fifth part of which is sulphate of copper; four kilogrammes of sulphate of copper sufficing for one hectolitre of water. Care must be taken to dip the extremity which is to enter the earth, two days at latest after the wood is cut. The greener the wood is, the more complete the absorption of the liquor.

We have seen some stakes prepared by means of oil or coal tar, entirely devoured after it had been seven years in the earth, by the larvæ, better known by the name of "le cerf volant;" while the stakes prepared in sulphate of copper, and planted at the same period (1847), were perfectly preserved. The wood was as hard, sonorous, and sound as on the first day of planting. M. Boucherie has exhibited some sleepers for the purpose of supporting the stone-blocks on railroads, both with and without being subjected to this process. The wood was sunk in the ground in 1847, and taken up again in 1854. The latter were completely rotten, while the former were untouched. The directors of the principal railroads have recognized the necessity of preserving their sleepers, on the renewal of which they had expended not a little during the whole of these seven or eight years. Different processes had been adopted for that purpose, but we think that that of MM. Boucherie and Jourdan, by the employment of sulphate of copper, will present the most satisfactory results.

The only difference we have been able to perceive between the two methods, is that M. Jourdan uses immersion simply, while M. Boucherie introduces the fluid into the wood by making incisions and openings, to which he applies a lump of tow, which constantly imbibes the liquid through an Indian-rubber pipe. This pipe communicates with a reservoir placed at an elevation of two or three metres, and hence results a pressure, which forces the preserving liquid into all the veins of the wood. This mode appears preferable to immersion, which is, perhaps, difficult of application to large pieces.

We must also note a small hand thrashing-machine of M. Laurent Rose's, which is so simple that any one could construct it for himself, without having recourse either to a locksmith or joiner. We ought, however, to add, that in the opinion of competent men every hand thrashing-machine is an absurdity. If it is wished to use the power of man to most advantage in the thrashing process, nothing is better than the flail; because with an instrument so simple a man can always employ his intelligence some way or other to obtain results which a machine cannot give.

We have still a debt to pay, and it is with the most lively satisfaction that we acquit ourselves of it, towards a country where agriculture is highly esteemed. Tuscany has sent a most interesting exhibition. The collection of agricultural products of the Society of Georgofiles, and that of the Royal Institute of Florence, and of the Society of Casentino, are remarkable for their variety and beautiful appearance. We have their corn, different forages, enormous ears of red maize, pine fruit, acorns, chestnuts, magnificent fullers' thistles for the manufacture of cloths, beans, French beans, almonds, &c. White wines, styled "Aqua di Pacciana" (which are said to be excellent), Italian pies, and olive oils, have also been exhibited by men distinguished both by fortune, birth, and talent, whom one would have hardly expected to attach their names to these humble and useful articles.

The placards of the exhibitors bear the names of Prince Thomas Corsini, the Marquis de Ridolfi, the Marquis Garzoni, the Count Orini, and Messrs. Ferd Filippi, Denis Pagini, &c. Tuscany has sent some ploughs, of solid construction, and easy to guide; but perhaps of rather rough workmanship. We have especially remarked Bell's harrow, which has been ingeniously modified to meet the exigencies of country tillage. They have affixed to this instrument handles, which serve to guide the penetration of the teeth, and to follow all the undulations of the ground.

The trials which were commenced at Trappes have been continued in the sheds adjoining the Palace of Industry; where the jury carried the chaff cutters, the root slicers, the oilcake bruisers, the winnowers, the churns, and the drill ploughs, to be set to work. We must hasten, however, back to Trappes for the present, where trials await us, as interesting from their novelty as from the importance of the problems they raise.

These trials recommenced on the 1st and 2nd of August. On the first, the jury had to examine some ploughs which had been brought to the ground since the last trials, and to prepare for working them on the

morrow. They proceeded to examine two dynamometers; one of General Morin's, which he had, with happy ingenuity, fitted with forewheels, like that of M. Bentall; and the latter as well. Still the dynamometer is not an instrument which we would recommend agriculturists to buy. The expense would not be in keeping with the services which they can render on a farm. But it is desirable that the great agricultural societies should be provided with it, in order that they might calculate at once, on the appearance of a new ploughing machine, the force of traction which it requires under the varying circumstances of soil and temperature. The agricultural schools of Grignon, Saulsaie, &c. ought to be provided with it, in order that the students might learn the use of it. We acknowledge that the absolute value of an instrument ought not to be judged of solely by the small amount of force of traction which it expends; but that it is necessary also to keep an exact account of the quality of the labour, of the style in which the strip of earth is twisted and broken, and of the fashion, more or less complete, in which the noxious weeds are buried; but we must allow that supposing all these conditions to be otherwise alike, the instrument which requires the least force is without contradiction the best.

It is vain for any one to urge that because the dynamometer has shown me that half the amount of draught is requisite for one plough as for another, I am about to give the lie to dynamometrical proofs, by putting but one horse to the plough, which has been drawn all day by two, and it will then contend in speed with that which you adjudge to be superior. We never can replace the rigorous exactness of a machine well made by bringing an animal force into play; and we cannot reasonably judge of these moving agencies by the efforts which are made by them for a limited time. The efforts more or less apparent which are made by a horse yoked to a plough, cannot serve as the basis of a rigorous calculation. A team is used up in two or three years; one often does not know how. One cannot exactly blame a want of care, faults of shape, or inferiority of breed; but we must primarily attribute this early decay to a too heavy draught. The dynamometer leaves no doubt with it as to its being an incomparable piece of mechanism, which measures force as a clock measures time.

In the first trials at Trappes the Bentall dynamometer could only be used; but in those of the 1st and 2nd of August that of General Morin well repaid the attention of the jury. The English dynamometer does not give the absolute, but merely the relative values; while that of General Morin's, on the contrary, indicates the real work done.

CLOSE OF THE GREAT PARIS EXHIBITION.

SPEECH OF THE EMPEROR.

The Emperor spoke in a firm, distinct voice, as follows: "GENTLEMEN: The Exhibition which is about to close offers a grand spectacle to the world. During a serious war, from all points of the universe the men most distinguished in sciences, arts, and industry have flocked to Paris to exhibit their productions. That concourse, under such circumstances, is owing, I trust, to that general conviction that the war thus undertaken only menaced those who had provoked it, that it was prosecuted in the interest of all, and that Europe, so far from seeing in it a danger for the future, considers it rather as a pledge of independence and security. Nevertheless, at the sight of so many wonders exposed before our eyes, the first impression felt is a desire for peace. Peace alone, in fact, can develop still more those remarkable productions of human intelligence. You must accordingly all desire, as I do, the speedy conclusion of a durable peace. But, in order to be durable, it must distinctly solve the question which caused the war to be undertaken. That it may be speedily concluded, Europe must declare itself; for, without the pressure of general opinion, struggles between great powers threatens to be prolonged; whilst, on the contrary, if Europe once determines on declaring who is right and who is wrong, it will be a great step made towards the solution. At the present period of civilization the successes of armies, however brilliant they may be, are only temporary, and it is definitively public opinion that always gains the last victory. You, then, who all believe that the progress of the agriculture, industry, and commerce of one nation contributes to the welfare of all the others, and that the more mutual relations are multiplied, the more national prejudices tend to disappear, tell your fellow-citizens, on your return to your country, that France has no hatred for any nation, and that she sympathises with all those who wish, as she does, for the triumph of right and justice. Tell them that, if they desire peace, they must openly express wishes either for or against us; for, amid a grave European conflict, indifference is a bad calculation, and silence an error. As for us, who are allied for the triumph of a great cause, let us manufacture arms without any abatement of our industry or labour; let us be great by the arts of peace as we are by those of war; let us be strong by our union, and place our confidence in God, that we may overcome the difficulties of the present, and the chances of futurity."

The following are the names of the English agricultural exhibitors who have received medals and honourable mention:

MEDALS OF HONOUR.

W. CROSSKILL, Beverley.
R. GARRETT and SON, Saxmundham.
R. HORNSBY and SON, Grantham.
J. and F. HOWARD, Bedford.
RANSOME and SIMS, Ipswich.

FIRST CLASS MEDALS.

W. BALL, Rothwell, Kettering.
BARKER, Victoria.
E. H. BENTALL, Heybridge.
W. BUSBY, Newton-le-Willows.
R. COLEMAN, Chelmsford.
UNIVERSAL EXHIBITION COMMITTEE, Guiana.
CANADA COMPANY, Toronto.
LONDON MANURE COMPANY.
E. COX, Fern-hill, New South Wales.
G. CROSS, Montreal, Canada.
J. DEAN and SON, London.
DICKENSON, Hewatt, Van Diemen's Land.
DOUGLAS, Victoria.

D. Gibson, Van Diemen's Land.
J. C. Gie, Cape of Good Hope.
R. E. Kormode, Van Diemen's Land.
W. Lyman and Co., Montreal, Canada.
J. W. M'Arthur, Camden, New South Wales.
J. and W. M'Arthur, Camden, New South Wales.
M. H. Marsh, New England, New South Wales.
Smith and Ashby, Stamford.
W. Smith, Kettering.
The Flax Society of Encouragement of Ireland
Ralph Wade, Cobourg, Canada.
N. B. Ward, London.
Wright, Van Diemen's Land.

Second Class Medals.

T. B. Bayley, Cape of Good Hope.
Burgess and Co.
G. Cox, New South Wales.
J. Fisher, Montreal, Canada.
Fleming, Toronto, Canada.
Flett, Manning River, New South Wales.
J. Grant, Van Diemen's Land.
Hutton, Victoria.
D. Laurent, Varennes, Canada.
T. Learmouth, Victoria.
J. Milligan, Van Diemen's Land.
L. Moise, Milton, Canada.
Noufflard, Sydney, New South Wales.
Parks and Co.
Richardson Brothers, Edinburgh.
Dr. Royle.
Alexander Shaw, Toronto, Canada.
G. Shepperd, Montreal, Canada.
W. P. Stanley, Peterborough.
Neighbour and Son.
R. Wade, Coburg, Canada.
Walker and Son, Van Diemen's Land.
Williams and Saunders.

Tipperary flax; Roscommon flax; Cork flax; Armagh flax.

Honourable Mention.

Coffin, Canada.
Corne.
J. Dean and Son, London.
Dray and Co., London.
Evans, Montreal, Canada.
F. W. Jarvis, Toronto, Canada.
Neighbour and Son.
Shanks and Son.
The Abbe Villeneuve, Montreal, Canada.

Antrim flax; Armagh flax; Down flax; Limerick flax Londonderry flax.

CO-OPERATORS, FOREMEN, AND ARTISANS.

Second Class Medals.

John Bonnal.
John Crosskill.
Joshua Hill.
Jacob Scott.
William Worby.

THE LEICESTERSHIRE AGRICULTURAL SOCIETY.

THE KEYTHORPE SYSTEM OF DRAINAGE.

The ploughing and draining matches, under the auspices of this society, took place on the 1st instant, on the farm of Lord Berners, at Keythorpe. The local attendance was numerous, notwithstanding the wetness of the weather. As guests of his Lordship at the Hall, there were present the following gentlemen from other districts, viz.—M. Trehonnais, a celebrated French agriculturist, who is actively engaged in connexion with the French Government in the introduction of the English breeds of cattle and system of farming into France: Mr. Mechi, of Tipree; Mr. Bullock Webster; Mr. Baker, of Writtle; Mr. Wilmot; and Mr. Trimmer, the last-named of whom had been the first to bring the Keythorpe system of drainage into general notice, and to explain the principles on which its success depends. The wetness of the weather afforded a complete test of the efficacy of the system. There had been heavy and incessant rain for forty-eight hours, and yet upon the strong clay loams of this farm, with a substratum of lias clay, into which, in their undrained state, after such a rain, a horse would have sunk fetlock deep, there were assembled 26 ploughs in one field as competitors for ploughing their half-acre each, and 23 in another as competitors for ploughing a straight furrow. One of these fields contained 20 A. 1 R. 23 P., and had been drained in 1851, at an expense for labour of £32 7s. The other, a clover ley, in which the 26 ploughs were assembled, contained 17 A. 2 R. 10 P., and had been drained at a cost for labour of £32 15s. 7d.

While the judges were deciding on the merits of the work, the ploughmen and drainers sat down to a substantial dinner at the farm, after which the prizes to the successful candidates, and the gratuities to the unsuccessful, were announced by his lordship, accompanied by exhortations and advice as to their moral and religious conduct, which was delivered with much feeling and received apparently with deep attention.

At the dinner which took place in the Hall, to which many on the ground were invited, and at which upwards of seventy partook of his lordship's hospitality, after the few public toasts customary at these meetings—"The Queen," "The Royal Family," and "The Army and Navy"—had been given by Lord Berners, he proceeded to the agricultural toasts, and called for the agricultural observations to which they were intended to give rise. His lordship first mentioned the name of Mr. Trimmer, and called upon him for an explanation of the Keythorpe system of drainage, and the principles on which it is founded. In responding to this toast, Mr. Trimmer briefly pointed out the absurdity of supposing that the variations of soil are dependent on the strata of our geological maps, in which all the superficial accumulations are supposed to be removed, and the rock nearest to the surface is represented as the actual surface, though those superficial deposits vary in depth from something less than a foot to more than two hundred. He stated that having long made these superficial accumulations his special geological study, he had pointed out, in 1837, in a paper on the Agricultural Geology of Norfolk, in the *Journal of the Royal Agricultural Society*, that at the junction of the soil and subsoil there are at certain depths a series of natural ridges and furrows, which have in general a determinated direction, and he had intimated that they must have an important bearing on questions connected with draining and subsoiling. In a lecture delivered some years afterwards before the Royal Agricultural Society, he had pointed out how he considered that the contradictory statements, so frequent in the controversy then raging, as to the failure or success of deep or shallow draining, might be reconciled, by observing whether the drains crossed or ran between these natural subterranean ridges and furrows. He further stated that Lord Berners, who was present on that occasion, had observed that if what Mr. Trimmer called ridges and furrows were what in Leicestershire they called "clay banks," he could bear testimony to the soundness of these views, as he had for many years been in the habit of taking advantage of them in drain-

ing operations, and had thereby been enabled to effect considerable reductions in the cost. On subsequent visits to Keythorpe, Mr. Trimmer had found these clay banks identical with the natural subterranean ridges and alternating furrows which he had observed in so many other localities in England, Wales, and Ireland. In conclusion, he adverted to the presence of Mr. Mechi, Mr. Bullock Webster, and Mr. Baker, as the respective representatives of deep, of moderately deep, and of shallow draining; and expressed a hope that they would favour the meeting with their views of the Keythorpe system of draining.

Lord Berners then proposed the health of Mr. Bullock Webster, who, in returning thanks, bore testimony to the efficiency of the draining at Keythorpe, and adverted to the absurdity of supposing that water can filtrate through a retentive clay, as stated by some great draining authorities. He adverted to some peculiar views entertained by Mr. Mechi on this subject, and begged to reserve himself for a few further observations when that gentleman should have spoken.

The health of Mr. Baker, of Writtle, having been proposed, that gentleman returned thanks in a speech of great length, which we are precluded by our plan from noticing more than the part which related to the Keythorpe drainage. He bore his testimony to its efficiency as well as to the excellence of the farm practice and management of the estate, denied that he was a shallow drainer, as he had been represented by Mr. Trimmer; though he contended that if there were a pervious soil only two feet deep on an impervious subsoil nothing was gained by carrying the drains into the latter.

Then followed the great speech of the evening, that of M. Trehonnais, who, in the most feeling and eloquent terms, adverted to the happy union now subsisting between France and England, who were shedding their best blood together in the cause of freedom and civilization. He then adverted to the eminence of the British nation in arms, in arts, in commerce, in science, in literature, and in agriculture; to the shortcomings of his own country in the latter, to the labours in which he was engaged for its improvement, and the difficulties with which he had to contend from the want of a race of trained and skilful rurallabourers, like those of England.

A reverend gentleman, whose name we did not learn, in proposing the health of Lord Berners, adverted to his lordship's care of the labourers on the estate, and to the improvement which had taken place of late years in their treatment throughout the country generally, although much yet remained to be done.

Lord Berners having responded with much feeling, then proposed the health of Mr. Mechi, adverting to his labours in the cause of agricultural improvement, his zeal as a bold experimenter, his candour in communicating his failures as well as his successes, and the unruffled good temper with which he endured the severest criticisms.

Mr. Mechi, who was very well received, adverted to the various agricultural subjects which form the staple of his speeches; spoke of the success of his own farming operations, the profit which he was making by his farm, the amount of which excited some laughter, eulogised all he had seen at Keythorpe, and bore testimony to the efficiency of the drainage, though he did not touch on the peculiarities upon which the success of the Keythorpe system depends.

In the course of the evening, the judges of the ploughing, the office-bearers of the society, and several of the farmers made some interesting and valuable remarks on a variety of practical questions, and the party broke up under the impression that they had rarely spent a more agreeable and instructive evening, or one in which a greater variety of topics had been discussed, without undue prominence being assumed by any.

DEBENHAM FARMERS' CLUB.

The sixteenth annual meeting of the Debenham Farmers' Club was held on Friday, October 26th, at the Cherry Tree Inn, when the following prizes were distributed amongst the cottagers of that place and the surrounding villages. It is most gratifying to see how much the garden produce of cottagers is improved by the distribution of small sums as prizes for the best productions, and by bringing them into public competition with each other. They may now vie with market-gardeners in the vicinities of large towns; still it must be regretted that such a means of social reform and improvement is left to the support of a few members of a farmers' club. If one thing more than another is calculated to raise our rural population above the haunts of the village ale-bench, the love of the garden, the first step to the love of home, is worthy of the encouragement of those who say they have the care and oversight of souls; for, "of all the occupations in life, without satiety at the time or self-reproach afterwards, none is so natural or attractive as gardening—the first employment appointed to man by his Maker, and almost the only one of which the reward is certain and lasting. Nature, as you see here, is not niggardly in the return she makes for any labour we bestow upon her." Best half-peck of early potatoes, 3s., John Wade, Debenham; second do., 2s. 6d., Jonathan Turner, Debenham; third do., 2s., Rachel Smith, Debenham; fourth do., 1s. 6d., Daniel Turner, Debenham; fifth do., 1s., Robert Pyett, Debenham. Best half-peck of late potatoes, 3s., Daniel Blomfield, Stonham; second do., 2s. 6d., Daniel Turner, Debenham; third do., 2s., Rachel Smith, Debenham; fourth do., 1s. 6d., Thomas Hurn, Debenham; fifth do., 1s., Robert Pyett, Debenham. Best half-peck of kidney potatoes, 2s., Daniel Blomfield, Stonham; second do., 1s. 6d., Henry Whiting, Framsden; third do., 1s. John Wade, Debenham. Best half-peck of red potatoes, 2s., Robert Pyett, Debenham; second do., Thomas Hurn, Debenham. Best quarter-peck of common onions, 2s., Robert Wade, Debenham; second do., 1s. 6d., William Wyand, Debenham; third do., 1s., Samuel Smith, Debenham. Best quarter-peck of potato onions, 2s., Widow Simpson, Debenham; second do., Henry Whiting, Framsden. Best twelve carrots, 2s., Robert Wade, Debenham; second do., 1s., William Kersey, Debenham. Best twelve parsnips, 2s., Daniel Turner, Debenham; second do., 1s., John Marjoram, Debenham. Best three savoys, 2s., Robert Wade, Debenham; second do., 1s., Rachel Smith, Debenham. Best two red cabbages, 1s. 6d., Daniel Blomfield, Stonham; second do., 1s., Henry Whiting, Framsden. Best three Brussels sprouts, 1s. 6d., Daniel Blomfield. Best six roots of celery, 1s. 6d., Rachel Smith, Debenham; second do., 1s., Samuel Smith, Debenham. Best two pumpkins, 1s. 6d., William Miller, Winston; second do., 1s., Henry Whiting, Framsden. Best dish of dessert apples, 1s. 6d., Samuel Long, Debenham; second do., 1s., John Wade, Debenham. Best dish of "Kit" apples, 1s. 6d., Jonathan Turner, Debenham; second do., 1s., Mrs. E. Smith, Debenham. Best dish of dessert pears, 1s. 6d., William Curtis, Debenham; second do., 1s., William Reevesby, Debenham. Best dish of baking pears, 1s. 6d., Abraham Crowe, Debenham; second do., 1s., James Kerridge, Winston.—The members afterwards took dinner, prepared by mine host Tydeman, in his usual liberal style, and spent a most convivial evening.

THE WHEAT CROP OF 1855.

SIR,—Having read the letters of Mr. Caird and Mr. Hubback, on the estimated produce of this year's crop of wheat in comparison with that of 1854, and having paid some attention to the subject matter at issue, I am induced to offer a few practical observations to your notice on those two letters. In the first place, allow me to observe that there cannot be any doubt that the harvest of 1854 produced the largest yield of wheat ever known in England. My present object, however, is to draw a comparison with that crop, and not with what may "*be supposed*" to be an average crop of the United Kingdom.

In 1853 we had one of the finest seed-times ever known, and every reasonable effort was made to sow an *extended breadth* of wheat over that of 1852; when a considerable increase was the result. Now, as a practical farmer, I well know you cannot force an increase of acreage to any extent year by year; and in my opinion *no* great increase was made in the seed-time of 1854, and moreover it was *not* by any means so favourable for the operations as that of 1853. On this point, therefore, I must differ entirely from Mr. Caird, placing no reliance whatever on his figures, 3,375,000 qrs. The winter of 1853-4 was favourable for wheat, the spring and summer were all that we wished for, and an early harvest was the result. Every grain was, comparatively, well secured. In July, 1854, I ventured to predict that there would be more quarters of wheat grown than were ever known in England; and I have reason to believe this prediction was verified.

Taking the crop of 1855, I repeat, the seed-time in 1854 was not so good a one as in 1853. The commencement of the season was far too dry, and much land *could not* be ploughed so early as usual, or till the rain came: and time was lost. Then, the latter part of the season was interfered with by unfavourable weather. The long-continued frost did much harm to the growing crop, and the plant was extremely weak and backward in the spring of this year. The warm weather of July forced *it far too rapidly*, and the consequence was that a great breadth of wheat became lodged long before harvest. The blight also made its appearance in many places. The harvest generally was fourteen to sixteen days later; and, although a fine one, the wheat was *not* secured in so *good condition* as in 1854.

As the best evidence I can adduce, by way of illustration, I will now, sir, give you the result of my thrashing, so far, as I annually thrash out a large lot of wheat and dispose of it for seed-corn. In 1854 I thrashed out 280 qrs., and I had 15½ qrs. of small and refuse corn dressed out, or say equal to *one in eighteen*. In 1855 I have thrashed out 392 qrs., but have 49½ qrs. of small and refuse corn, or *one quarter in eight*. Again, the wheat in 1854 weighed 63lbs. per bush., or 18st. per sack. The wheat of this year weighed barely 60lbs., or 17st. 2lb. per sack, being a loss of fully 1-20th in weight only, in addition to the great increase of the inferior corn.

Furthermore, I find on my largest crops a deficiency of 1½ qrs., and on the average ones about 1 qr. less in yield per acre than in 1854. The cultivation of the land, and the land itself, is as nearly similar as can be, namely, strong soils, well adapted to the growth of wheat, well drained, and well dressed with guano in each year; in fact, I may fairly say each crop has been equally and highly cultivated.

Now, sir, allow me to observe that, although I have not exactly traversed the kingdom from the Solent to John o'Groat's, I have seen an immense deal of England during the last two years, while I have spent all my time in the pursuits of agriculture; and having grown myself, or had the management of, crops of wheat of about 400 acres in each year, the result of my practice and observation is, that the wheat crop of 1855 will yield nearly one-fourth *less food for the people* than the crop of 1854; and I think Mr. Hubback's calculation, that an import of between 4 and 5 million qrs. will be required, is a very fair one.

As far as agricultural statistics are concerned, I am of opinion that it would be highly desirable to have a correct return of the acreage and crops under the various cultivation annually made; but I do not believe that any approximate return of the quantity to be produced can be obtained by any survey and estimate of *growing* crops. This year's crop, when placed in juxta-position with that of 1854, is a proof of my opinion: no estimate of it in a growing state could have been made near truth. I am inclined to think that, if more stringent measures were adopted with the "corn returns," as to quantity, and thus having a knowledge of the corn brought to market in the previous year, compared with the acreage of that year; and having the acreage of the present year, a better estimate might be formed than any abstract valuation of a growing crop could afford;—to say nothing of the immense difficulty and expense of having all the crops of corn properly valued in a *few days*. I beg to apologise for the length of this communication, and I am very truly yours,

Aylesby, Nov. 15. W. TORR.

P.S. I might add that on the extensive wolds of Lincolnshire, where I also occupy a farm, I fear the deficiency will be greater than on the land I have spoken of.

THE WAY TO INCREASE YOUR MEANS BY INCREASING THE PRODUCTIVENESS OF YOUR FARMS.—1st. Subscribe to two or three good standard agricultural papers, and cultivate in yourself and family a taste for reading and improvement of mind as well as body; this is of the first importance. 2nd. Keep a regular system of accounts, charging your farm with all the labour and expense of cultivation, and crediting it with the market value of the crops raised; by this means you will know how you stand at the end of the year. 3rd. Cultivate less land and do it thoroughly, sooner than skim a large tract and cultivate but poorly. 4th. Convert your hay, straw, stalks, and a large share of your grain into beef, mutton, and pork, sooner than sell it to be used in this way by speculators. 5th. Provide good warm comfortable shelter for all your stock through the winter months. By this

means you will require less feed and save a great deal more manure. Provide also if possible shelter for your manure from the washing and evaporating effects of rains and sun. 6th, Pursue a proper and judicious rotation of crops, instead of following the old method of keeping one lot for pasture, and another for meadow, another for wheat, and so on for a succession of years. Change them every three or four years, and by supplying such inorganic manures as become deficient in the soil, you will keep up the original fertility of the land. And last, though far from least, "have a place for every thing and keep every thing in its place." A hundred other hints might be given on this subject, but fearful of tiring the patience of you and your readers, I will close, mentioning however to my brother farmers, only try this plan and I will guarantee that in three years' time they will find themselves 50 per cent. richer in their own and family's comforts, in the depth of their pocket, in the value of their farm, and the flocks and herds around them.—Wm. F. Sands, in *Michigan Farmer*.

ON STORING TURNIPS.

Much has been written on this subject, but it is one of those which excites constant thought and attention, and should from time to time be brought under revision. There certainly cannot be a better time for such review than the present, when the prospects of the crop are far from generally encouraging. Besides the numerous blanks, amounting in many places to failure of a half, from early drought, the weather seems prematurely to have forced on the plant, so that it is set too soon, is in many places beginning to mildew, and perhaps in none swelling as was hoped after the late soft and moist weather; while the late sudden turn to frost will, it is to be feared, check in a great measure its future progress. Fodder is not large, though generally of fine quality and in good order, so that the prospect of making the most of cattle when sold fat, being laid in at enormous prices, though in good condition, will render economy of food very necessary. The prospects of preserving the root crop will this season become the more anxious from the recollection of the severe loss and destruction of turnips during the protracted and harassing storm of last winter, so piteously described in the quarterly returns of April last to the *North British Agriculturist*. The first question is the benefit of the practice. Smarting under the effects of last year's storm, few will deny that, if the turnips are not injured, and if it can be accomplished without deranging other work, it is desirable to put them beyond the reach of exposure. On the first point we have now some valuable data to go upon, from experiments carefully performed at Monymusk, for the report of which the Highland Society's gold medal was lately given. In the end of November, 1854, the necessary quantity was stored, and the experiment commenced on the 28th of January, 1855, when eight cattle, crosses between the Aberdeen and short-horned breeds, rising two years old, were tied up, after being divided into two lots, as equal in weight and quality as possible. One lot was fed on stored turnips, the other on the same kind of turnip, from the same field—the best "golden yellow" variety—pulled for them every day, all clear of tops and tails. The byre was well ventilated, and kept as nearly as possible at 48 degrees thermometer. Both lots received equal quantities of turnips, nearly as many as they could eat, averaging about 95lb. a day for each, with straw *ad libitum*, having been kept in the same way in sheds, four and four together, on straw and headed turnips from the 20th of October, when they were put up, till the experiment commenced. The weather was for two months snowstorm, and one month windy spring drought, during the thirteen weeks the experiment lasted, up to the 22nd of April—well calculated, surely, to test the effect of storing upon these roots as compared with those fresh pulled. The following is the tabular result for eighty-four days, omitting the weights at the intermediate periods:

Lot	No.		Weight. Jan. 28.			Weight. April 22.			Increase.		
			cwt.	*qr.*	*lb.*	*cwt.*	*qr.*	*lb.*	*cwt.*	*qr.*	*lb.*
1	1	Stored Turnips	8	0	0	8	3	14	0	3	14
	2		8	2	0	8	3	0	0	2	14
	3		8	0	14	8	3	21	0	3	7
	4		9	2	0	10	0	14	0	2	14
		Total							2	3	21
2	1	Pulled Turnips	9	0	0	9	2	14	0	2	14
	2		7	2	14	7	3	21	0	1	7
	3		9	2	7	10	0	14	0	2	7
	4		8	0	0	8	1	14	0	1	14
		Total							1	3	14
		Balance in favour of stored turnips							1	0	7

The cattle were weighed the same hour, ten o'clock each day, before being fed. They were growing young beasts, and therefore did not increase rapidly in weight. The improvement was not apparent in the increase of weight alone, but in the superior appearance of the first lot, their sleek and fresh coats, and better-filled-out figures. The turnips were grown on a sharp black soil, chiefly with farmyard dung, and weighed twenty tons of bulbs per acre imperial, fresh and free from disease; but lot No. 2 required one ton more to supply them with equal weights for those rotted by snow and vermin, equal to 7s. worth, quite enough, without any other item, to pay the expense of storing. Upon the other point—the possibility of effecting the storing of the crop before the storm sets in—we know that in ordinary seasons the growth of our turnips is completely checked before the end of November, and any active vegetation after that period goes to draw out the crown of the shaw in preparation for the process of shooting, which tends to harden the fibrous part of the bulb, and draw away its nourishing properties. The lea ploughing, to be sure, is in progress; but there is generally time enough for all the horse work required, without interfering with that, and the saving of time in carting the turnips home through the season much more than counterbalances that. As to the proper time and mode of effecting the operation: The exact period should be allowed to fluctuate a little, along with other farm operations, according to the state of the roots. They ought to be as near as possible ripe, and this season, to all appearance, they will soon be at their best. The globes, of course, are never stored, and no more of them should ever be sown than to keep the stock on to December. The opportunity of a dry time for lifting should, if possible, be chosen. It is just as desirable for turnips as potatoes that it should not be plashing wet, though a shower or two are of no consequence. The yellows should be first stored, as they are ripe before the swedes, and do not keep quite so long; and frosty weather must be avoided, as it is sure to affect them afterwards in the store. The tops must be left a little above the turnip rather than break the skin, and the roots cut only to clear off dirt. Broken turnips are sure to putrefy, and affect their neighbours; and all diseased tubers must be kept out. The tops should always be left on the field and ploughed in. The places for storing are the steading or the field. At the steading, the store should be either a ridge seven or eight feet wide below, and heaped at an angle of 45, thatched with straw, or a house of wood, with room for a cart,

made with posts and boeks of trees; eight shillings an acre, besides cartage, should cover the expense of pulling and pitting. These arrangements apply to a six weeks' stock; but the bulk of the crop should be stored in the soil, where they keep better. The plan recommended for this is to take a piece of the field twelve drills wide, pull the two centre drills' crop, throwing the turnips aside, and turn out a heavy plough furrow to both sides, at two bouts, ten or twelve inches deep. Then throw the produce of the twelve drills, trimmed, into it, and two furrows of the plough will pretty well cover them. This forms a most effectual protection, though no doubt it takes some time to get them up, and in wet weather they are not always clean. Another way is to pull three or four drills at a time, and heap them into the centre row in round heaps of about a cart-load each, from which they are easily brought home. The expense of the former plan, under ordinary circumstances, may be 9s. per acre, that of the latter 9s. 6d.; women and boys might do it somewhat cheaper on an average. Either plan will answer well, and save immense loss from exposure in the common way. If we look at the space each turnip occupies, calculate the average number to an acre, and estimate the expense of the whole operations in preparing them, of which the present price at roups is the fair exponent, the smallest turnip begins to have a value that renders it worth while to give it justice in preparing it for the meat manufactory. If the plan of storing turnips were once elevated, as it ought to be, into the position of a regular part of farming routine, just like pitting potatoes, work would be easily arranged to put it through in the cheapest and most expeditious manner.—Kentish Gazette.

A CONCISE TABULAR STATEMENT, SHOWING THE DISTANCE REQUIRED FOR PLANTING OR SOWING VARIOUS QUANTITIES OF WHEAT GRAIN.

There are from 16,000 to 20,000 grains of wheat contained in one quart, or 608,000 to 640,000 in one bushel, and 6,272,640 square inches are one statute acre of land. Taking the latter number as a rule, it necessarily follows that about 10 square inches are thus allowed for each grain, admitting all the land to be sown uniformly without furrows, or 14 grains on each square foot, or 132 on each square yard, or 4000 on each square rod, at one bushel of seed for an acre. The following simple tabular form will, we trust, serve to show the different distances from each plant, at this ratio, from more or less quantities of seed, which may or may not be thought most proper to be sown by any of our agricultural friends. For general sowing on a large scale we ourselves think proper to draw a line of distinction, say one bushel or somewhat less for an acre, avoiding either extremes; bearing in mind, however, the fact and possibility of growing a large amount of produce from a small quantity; and the impossibility of reaping an average crop from a full plant of a large quantity of seed.

Per Acre.	Grains for an acre.*	Grains for a rod.	Grains for a yard.	Grains for a foot.	Inches for each grain.†
3 bush. gives about	1,920,000	12,000	396	44	4
2 ,, ,,	1,280,000	8,000	264	29	6
1 ,, ,,	640,000	4,000	132	14	10
2 pecks ,,	320,000	2,000	66	7	20
1 ,, ,,	160,000	1,000	33	3½	40
½ ,, ,,	80,000	500	16½	1¾	81
¼ ,, ,,	40,000	250	8¼	1	162
1 quart ,,	20,000	125	4	0	324
1 pint ,,	10,000	62	2	0	648
½ ,, ,,	5,000	31	1	0	1296

HARDY & SON, Seed Growers, &c.,
Waldon, Essex.

* At 20,000 grains in a quart, and 6,272,640 inches in an acre.
† Omitting fractions.

LONDON FARMERS' CLUB.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—I find, by reading your valuable paper, that I did not make myself clearly understood by your reporter at the late meeting of the London Farmers' Club. What I intended to imply was, that I thought it better to put either boiled linseed, or cake boiled, over the cut chaff before applying the meal or flour, and then mix the whole well together, otherwise some portion of the latter would fall to the bottom of the manger, and consequently be liable to waste.

I may add, that a gentleman from Surrey, Mr. Bradshaw, said that he found his cattle generally scouring when fed on linseed and meal; but I have used linseed in the way I have stated for the last ten years, and shall continue it, provided I can procure it at a reasonable price. When I find any of my cattle too loose I use a greater portion of bean-meal, which has never failed to counteract the effects of purging.

I shall be obliged if you will kindly insert the above remarks in your next paper.

I remain, Sir, your obedient servant,

Bletsoe, Nov. 16. JNO. THOMAS.

REVIEWS.

THE FARMERS' ALMANAC FOR 1856.

By CUTHBERT W. JOHNSON, Esq., and WILLIAM SHAW, Esq.

James Ridgway, Piccadilly.

A few years since, a landed proprietor stated at one of our agricultural meetings that he had hit upon what he considered a most useful present for his tenants, both farmers and cottagers. It was not, either, an expensive one; while, if only properly appreciated, he was quite sure it might be the means of effecting a great deal of good. This gift in season turned out to be a copy of the then new number of Johnson and Shaw's Farmers' Almanac. Well-merited as such a compliment was at that period, it is still more so now. The Farmers' Almanac has in every way kept pace with the times. Its annually increasing popularity amply demonstrates this; a support clearly shown in the pages of the book itself. There is not a society, a work, or an invention in any way connected with the wants or interests of agriculture, but that is duly registered in the advertisement sheets of the Farmers' Almanac. This proves how well the book is appreciated by those who have consulted it; while its more immediate material not only as a farmer's almanac, but a farmer's adviser, has fairly earned for it that established character it now enjoys. Whether we look to the many reminiscences of the bygone year, associated as they are with the development of agriculture, or turn to what we may expect from that approaching, we find the same careful research backed by equally good taste and arrangement. Seldom has so great an amount of information been so closely packed; and while the point you may want is sure to be in it, there never can be any difficulty in finding it. Beyond this, the almanac is well and clearly printed, a great recommendation with such a multum in parvo, and altogether as extraordinary a shilling's worth as ever agriculture had the chance of investing.

"PEAT'S FARMER'S DIARY AND ACCOUNT-BOOK" for 1856.

LONDON: SIMPKIN AND MARSHALL.

This very neat little handbook has now reached its third anniversary. It is one of the most convenient of note-books, and in its arrangement as a record and remembrancer goes a step further in the right direction—viz., towards simplifying the grand mystery of farmers' accounts. For the Field, the Market, or the Fair, the "Farmer's Diary" will always have its use and value.

AGRICULTURAL QUERY.

"A Farmer" feels sorry to trouble the editor of the "Farmer's Magazine," but applies to him, as the most reliable source, to let him know the difference of the blue vitriols used for soaking wheat, as it is offered to him at three prices: the highest-priced druggist says the cheaper is mixed with green copperas and with coloured alum, while the cheaper man says his is just as good as the dearest.

1. Is sulphate of iron or coloured alum used for adulterating the blue vitriol?

2. And what effect would they produce on the seed?

3. Or is anything else used to cheapen the article?

4. Some tell me that this sulphate of iron, or green copperas, as they say it is the same thing, kills the germ of every seed it touches. Is this so?

"A Farmer" will feel very grateful for an answer in the next number of the "Farmer's Magazine," and feels sure the subject will be useful to agriculturists at large.

[The salts which "A Farmer" thus refers to are all salts of the same class, viz., sulphates:

Blue vitriol being sulphate of copper;
Green vitriol being sulphate of iron; and
Alum being sulphate of alumina and potash.

The first-named is worth about 43s. a cwt., the second only 5s. Green vitriol and alum possess totally different properties to those which give blue vitriol its value. When dissolved in water, as a steep for seed-wheat, they are quite unable—either when used singly or in combination—to supply the place of blue vitriol. Blue vitriol is supposed to act beneficially by being destructive of the minute seeds or germs of the fungi, which constitute certain diseases of wheat. Sulphate of iron and sulphate of alumina and potash have no action in this way.]

MORAYSHIRE FARMER CLUB.—At the last half-yearly meeting of this society, two agricultural questions were discussed, and the following were the conclusions arrived at: The first was—That the average land of Morayshire would be worth from 5s. to 8s. more per acre if enclosed with sufficient stone fences, and that it would thus be improved about 20 per cent. That a tenant might warrantly give 10 per cent. on the outlay, exclusive of carriages, or 5 per cent. with carriages, where stones were within a reasonable distance. The other was—That in all cases where turnip fields are situated within a fair distance of the steading, and of easy access, and where the crop is to be consumed by sheep, it should be eaten under cover; where by cattle fed for the fat market, the cattle should be fed in stalls in well ventilated byres; where meant for grazing, in court-yards; and that a certain number of boxes should be attached to every steading, where weak and troublesome beasts might be accommodated, and that in the case of turnip fields situated at a distance from the steading, or difficult of access, the crop ought to be consumed on the ground by sheep.

FARM STEAM-ENGINES IN GLOUCESTERSHIRE.—A few days since a number of the friends of Mr. Edward Drew, of Calcot Farm, a tenant of Colonel Kingscote, assembled by invitation to witness the working of a steam-engine lately fitted up, and acting as a motive power to a thrashing machine, mill stones, bone mill, and other farm machinery, upon his occupation at Kingscote. The thrashing machine is on the Scotch principle, with English drum, and appears to combine the advantages of both; for in a trial o an hour and half upon mown wheat, with long straw, 20 sacks of wheat were thrashed and put up in sacks of four bushels each, and weighed 62lbs. per bushel, with but little aid from manual labour, when compared with machines in ordinary use. Everyone expressed himself well pleased with the working of the machinery, and much useful discussion upon the subject took place after the company had partaken of an excellent dinner provided for them by their host with kind and liberal hospitality. Among many toasts, that of "The Landlord" was received with hearty goodwill, who acts as all landlords should, in giving encouragement and security to his tenantry, by allowing compensation for permanent improvements. It is much to be desired that this encouragement was more generally extended to stimulate equally enterprising tenant farmers to avail themselves of the advantages afforded by a more liberal use of steam-power and improved machinery, in its application to agriculture.—(From our own correspondent.)

THE HOP DUTY.

An Account of the Duty on Hops of the growth of the year 1855, distinguishing the districts, and the old from the new duty:—

DISTRICTS.	DUTY. £	s.	d.
Barnstaple	43	1	9¾
Canterbury	161,011	9	3¼
Cornwall	1	13	11¼
Coventry	3	1	11¼
Derby	124	15	7¾
Essex	1,694	16	6½
Gloucester	59	18	2½
Grantham	14	11	0¼
Hants	32,118	0	10½
Hereford	40,473	15	8½
Isle of Wight	20,737	1	4
Lincoln	192	5	5
Northampton	35	12	11¼
Oxford	8	11	6
Reading	121	5	10
Rochester	265,676	12	5¼
Sheffield	1,015	13	2
Shrewsbury	2	3	4¾
Stourbridge	10,824	9	1½
Suffolk	1,485	16	9½
Surrey	1,615	17	3¼
Sussex	177,896	15	3
Taunton	51	3	2½
Wales (Middle)	155	6	6½
Ware	16	17	11
Worcester	12,559	9	9¼
	£727,940	6	10¼

	£	s.	d.	
Old duty, at 1 12-20 d. per lb.	£393,635	6	5¾	8-20
New duty, at ¾ 8-20 d. „	294,643	10	0	12-20
Additional duty of 5 per cent. per Act 3 Vic., cap. 17 ..	34,661	10	4¼	
	£727,940	6	10¼	„

L. S. LYNE, A. and C. G.

Inland Revenue Office, Nov. 19.

BRITAIN COULD GROW THREE TIMES AS MUCH CORN AS IT DOES.—At a recent agricultural meeting, Lord Stanley mentioned that there are 77,000,000 of acres in the United Kingdom, of which 47,000,000 are cultivated well or badly, 15,000,000 cannot be cultivated, and are waste by nature, 15,000,000 may be cultivated, but have not been reclaimed—that is to say, that of the entire soil of the country we cultivate well or badly three-fifths. It is calculated that, by applying to the fullest extent the resources of modern science, we might draw from the land three times the present amount of sustenance which it yields. We feed say 20,000,000 persons with the produce of this country; if the resources of the country were fully developed it would be in our power to feed not 20,000,000 but 60,000,000. This states a most important fact which ought to be always present to our minds, and we should not cease our exertions till the possibility of feeding 60,000,000 persons by the growth of our own soil should have become a reality.

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind.		Atmosphere.			Weat'r.
1855.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 or 9 a.m.	2 p.m.	10 p.m.	
Oct. 22	30.20	30.15	54	61	57	Variable	calm	fog	fine	cloudy	rain
23	30.05	29.86	54	59	56	S. West	lively	cloudy	cloudy	cloudy	drizzle
24	29.93	30.10	44	55	43	W.S.W.	lively	fine	sun	fine	dry
25	30.05	29.60	42	53	53	S. West	strong	cloudy	cloudy	cloudy	rain
26	29.20	29.19	49	53	45	S. by W.	gale	cloudy	cloudy	fine	rain
27	29.35	29.60	39	51	36	W. and N.W.	gentle	fine	sun	fine	dry
28	29.68	29.70	35	51	44	N. by E.	gentle	fine	fine	fine	dry
29	29.55	29.26	41	48½	48	N. East	gentle	cloudy	cloudy	cloudy	rain
30	29.14	29.20	47	51	48	North	gentle	cloudy	cloudy	cloudy	rain
31	29.30	29.57	47	47	43	North	fresh	mist	cloudy	cloudy	rain
Nov. 1	29.69	29.69	35	42	33	N.N.W.	fresh	fine	sun	fine	dry
2	29.70	29.60	31	42	42	W.N.W.	fresh	cloudy	cloudy	cloudy	rain
3	29.69	29.83	37	43	38	N. East	brisk	cloudy	cloudy	cloudy	rain
4	30.00	30.11	33	46	43	North	gentle	cloudy	fine	cloudy	dry
5	30.18	30.18	31	50	43	Var.	calm	fine	sun	cloudy	rain
6	30.19	30.04	32	55	48	S. by West	fresh	fine	sun	cloudy	dry
7	29.93	29.75	47	52	46	S. by West	var.	cloudy	cloudy	fine	dry
8	29.61	29.63	45	49	43	S. by West	airy	cloudy	cloudy	fine	rain
9	29.78	29.78	37	54	46	South	gentle	fine	sun	cloudy	rain
10	29.71	30.03	45	53	47	S. West	gentle	cloud	fine	fine	dry
11	30.19	30.24	46	56	48	S. West	gentle	fine	sun	cloudy	dry
12	30.23	30.14	45	48	47	S. East	calm	cloudy	cloudy	cloudy	dry
13	30.07	29.99	42	45	41	N. East	gentle	cloudy	cloudy	cloudy	dry
14	29.99	29.99	38	44	35	S. East	gentle	cloudy	fine	fine	dry
15	30.10	30.15	28	46	31	Var.	calm	fine	sun	fine	dry
16	30.20	30.21	28½	42	38	N. East	calm	fog	sun	cloudy	dry
17	30.25	30.20	28	42	41	N. East	gentle	mist	cloudy	cloudy	drizzle
18	30.20	30.14	39	46	46	Easterly	gentle	mist	cloudy	cloudy	drizzle
19	30.08	30.08	40	41	41	E.N.E.	fresh	cloudy	cloudy	cloudy	drizzle
20	30.00	29.98	39	41	38	E. by S.	gentle	haze	cloudy	cloudy	drizzle
21	29.94	29.86	37	41	38	E. by S.	gentle	misty	misty	misty	dry

Estimated Averages of November.

Barometer.		Thermometer.		
Highest.	Lowest.	High.	Low.	Mean.
30.270	29.080	62	23	42.9

Real Average Temperature of the Period.

Highest.	Lowest.	Mean.
48.6	41.5	44.55

Weather and Phenomena.

October 22 and 23. Overcast, drizzle.—24. Fine. —25 and 26. Storm; much rain on the latter night. —27. Keen fine day.—28. Variable, but pretty fine. 29,30,31. Rainy, profuse fall above 1½ inches.—Total of the month at Croydon, 4.795 inches.

Lunation.—Full moon, 25th, 7 h. 27 m. A.M.

November 1. Fine and airy. — 2 and 3. Cold; much wet.—4. Partly fine.—Some rain on the 5th, 6th and 7th finer.—8. A dripping dew.—9, 10, and 11. Return of more settled weather.—12 and 13. Overcast.—14. Fine.—After hoar frost on the 15th and 16th, another morning frost, with fog, on the 17th. — 18. Changeable, and drizzling rain, with low temperature on the 18th, 19th, and 20th.—21. Smoky atmosphere; very gloomy.

Lunations.—Last quarter, 1st, 5 h. 17 m. P.M.; new moon, 9th, 7h. 21 m. P.M.; first quarter, 16th, 11 h. 15 m. P.M.

Remarks connected with Agriculture.

Upon the whole, a period of depressed temperature, true to November, but little conformable with October. However, every work has proceeded well. Heavy crops of mangel-wurzel are secured; turnips have improved; and the meadows are verdant as in spring. We learn, and also perceive, that ploughing has duly progressed; but we shall never rest in content till efficient steam cultivators are substituted for heavy ploughs.

John Towers.

Nov. 21.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR NOVEMBER.

Considerable excitement has been observed throughout the month, in consequence of the high value of all agricultural produce, and the immense amount of controversy going on respecting the yield of the present year's crop of grain. That the opinions given by Mr. Caird have been framed for the purpose of allaying popular excitement, and to keep prices in check, does not admit of a doubt. But the question to consider is, Are we to close our eyes to the fact that consumption in this country is considerably in advance of the production, and that we shall require a very large importation of food? Now, unquestionably, the best mode of meeting a difficulty of this nature is to obtain corn wherever it can be purchased, and to offer such prices for it as will tempt the importers to increase their operations. At the present moment, there is a good margin of profit on the imports of both wheat and flour from the United States; but it must be borne in mind that the wants of France are nearly as great as our own, and that, as a consequence, we have now a formidable competitor in the field for the first necessary of life. In our opinion, therefore, much mischief might be occasioned by the publication of statements which may have been penned for the purpose to which we have already alluded, were it not that there are counterbalancing influences at work, and which enable us to form a more correct estimate of our productive capabilities, and of our actual wants. To assume, as Mr. Caird has done, that 1,000,000 qrs. of wheat will be adequate to our additional consumption until the close of next harvest, is simply to argue upon a false basis; and a trifling acquaintance with the import trade will at once prove that even large crops of wheat in this country—and this year's supply is certainly not equal to last season's, either in point of condition or weight—have never been equal to the demand. We find, however, of late, a growing feeling in favour of lower prices; and this feeling appears to have resulted from two causes. In the first place, it is clearly apparent that a peace with Russia—which country appears to be completely exhausted in its struggle with the Western Powers—is not very far distant; and in the second, that the quantity of food produced in the United States and Canada, above the wants of both countries, is very large, even after making due allowance for exaggeration. On the other hand, however, there is evidently a scarcity of grain in Germany, Turkey, and Egypt: whilst it is stated on good authority that the future shipments of flour from Spain will show a considerable falling off. *Our* present position—though not one of extreme difficulty, because we are quite satisfied that high prices here will bring us all the corn that may be required over and above our own growth — is singularly important, because we find no decrease in the consumption, which is frequently the result of a high value; and to attempt to disguise the *fact* that our wants are very extensive, is simply to deprive us of a supply of foreign food which may be found highly useful at no distant day.

The barley crop is proving unusually poor in quality; indeed, a great scarcity of fine parcels fit for malting purposes is generally complained of: but that of oats, beans, and peas is proving larger than was at one time anticipated. The imports from abroad have been tolerably extensive, and prices—if we except fine barley—have been thereby kept in check.

The quantity of potatoes grown this year in all parts of the United Kingdom is, perhaps, the largest on record. The growth of English is turning out well, and of most excellent quality; but we regret to find that Scotch potatoes fail to keep, numerous cargoes lately received in London having proved unfit for consumption; consequently, they have been disposed of at very low prices. Still, that we have an immense quantity on hand, and that that quantity will in some measure affect the price of the better kinds of food, is evident from the state of the trade in the last week of the month.

Most of the leading cattle markets have been but moderately supplied with stock, in, for the most part, poor condition. The trade has continued in a healthy state, and prices generally have ruled higher.

Our correspondents state that the carrot and turnip crops are proving large, and of fine quality. In this respect, cattle will fare well during the winter; but the great scarcity of hay in many parts of the country must prove a serious drawback to the grazier's profits, and compel the use of large additional quantities of linseed cake, which article is now worth fully £14 per ton. A peace with Russia would, possibly, reduce the value of both English and foreign cake, though, up to this time,

the imports of linseed have exhibited no deficiency compared with former years; indeed, they have wonderfully increased from India, but the great continental demand, which has taken fully 3,000 quarters per week from London alone, for several months past, has left our market bare of supply.

The sales of colonial wool have been heavy, and prices have given way 1d. to 2d. per lb. No doubt the enhanced value of money has materially operated against them. In English wools a very limited business has been transacted, but without leading to any decline in value. The supply in the hands of the growers is large.

Owing to the high duty, and consequently to the large growth, the hop trade has been heavy, and the highest value of the best East Kent pockets has been £6 per cwt., against £21 last year. The imports of foreign hops have been about 550 bales; but we understand that the surplus growth in Silesia, this year, is fully 200,000 cwts.

In Ireland and Scotland the corn trade has been very inactive, and the transactions in most articles of grain have been on a very limited scale at drooping prices. The shipments of grain to England have rather increased.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Compared with some corresponding periods, the supplies of fat stock on sale in the Great Metropolitan Market have been very moderate; and we have observed a great falling-off in their general weight and condition. This deficiency of supply and weight has caused much surprise in some quarters, because they apply not only to the past month, but throughout the whole season from the North. When we consider the high and certainly remunerative prices at which all kinds of stock have been selling during the last two years, and the ready-money nature of the transactions in the metropolis, we cannot but regret that the northern counties should have been so much behind the eastern division of the country. In the first six months of the present year, we received from Norfolk, Suffolk, and Cambridgeshire an unusually fine supply of both beasts and sheep, and those, too, of heavy weight; but that from Lincolnshire, Leicestershire, and Northamptonshire during the past five months has shown an extraordinary falling off. To account for this deficiency would appear to be a matter of difficulty; unless, indeed, we assume that the quantity of food produced in the latter districts has been inadequate to the wants of the stock. Linseed and rape-cakes have, we understand, been consumed in great abundance; and this large consumption has had the effect of enhancing the value of those articles nearly, or quite, 30s. per ton. But this advance would scarcely justify the graziers in acting cautiously, as the returns upon sales, though not quite equal to November last year, are unquestionably large. However, it is a serious matter when natural food is scarce and artificial food is very dear, because those features in the account tell immensely against aggregate profits. But the question is, would not a little fresh blood introduced into the northern districts be highly beneficial to grazing as a business? In other words, would it not be advisable to breed or import a smaller and more useful description of stock? We do not, for one moment, wish to impute a want of skill or energy to the Lincolnshire breeders, who ought to know the capabilities of the soil in their own immediate localties better, perhaps, than ourselves; but we confess that we have been frequently disappointed in witnessing the arrival into London of animals which appear to have consumed an immense amount of food to very little advantage either to themselves, their owners, or the consumers. Let us not, however, be misunderstood. In some seasons, stock of great weight and value have appeared in London from the North; but when we look to Norfolk, and find that Scots and Shorthorns have thriven there with extraordinary rapidity, and when we find that the chief breed in the northern counties is *still* the shorthorn, and that its quality does not improve, notwithstanding all the care bestowed upon it, we are led to conclude that other breeds—less famed for *extensive stomachs*—might be more profitably introduced.

On the whole, the Cattle Trade has been in a healthy state, and prime beasts and sheep have realized rather more money than in the previous month; but we must admit that the total transactions have been small on a comparison of years. This feature in the trade requires some explanation. In the first place, we find that a large country trade has sprung up in the slaughtering of animals for consumption in London; and, in the second, that, since the removal of the trade of Smithfield to Copenhagen Fields, the near local markets have risen in importance, arising from numerous butchers, who formerly purchased largely in Smithfield, having attended them regularly. The quantity of dead meat, therefore, received up to Newgate and Leadenhall has been unusually large.

As there has been a falling off in the demand for stock in Holland, for consumption in France—in which country, however, prices still rule very high—the imports from abroad into London have been seasonably good as to number, though still defi-

cient in quality. The arrivals have been as follow:—

	Head.
Beasts	7,367
Sheep	17,094
Calves	1,127
Pigs	454

COMPARISON OF IMPORTS.

Nov.	Beasts.	Sheep.	Calves.	Pigs.
1854	7,120	16,604	1,108	369
1853	7,390	22,565	1,629	919
1852	3,102	18,152	1,215	427
1851	6,279	22,866	1,409	1,127
1850	5,928	17,662	1,058	1,486
1849	4,228	14,204	618	409

The total supplies of stock exhibited in the Metropolitan Cattle Market have been—

	Head.
Beasts	24,154
Cows	505
Sheep	105,750
Calves	2,096
Pigs	3,415

The annexed return shows the stock exhibited in the corresponding period of previous years:—

	Nov., 1854.	Nov., 1853.	Nov., 1852.
Beasts	23,442	25,760	23,583
Cows	515	562	435
Sheep	121,031	127,150	115,770
Calves	1,848	2,615	1,718
Pigs	2,726	2,790	3,210

Thus it will be seen that the supply of sheep exhibited in this month has fallen short of 1853 by over 20,000 head. From Ireland some excellent stock has been received; but we understand that the slaughtered weight of the animals has greatly disappointed the butchers.

The bullock arrivals from Lincolnshire, Leicestershire, and Northamptonshire have amounted to 9,900 shorthorns; from other parts of England, 2,500 of various breeds; and from Scotland, 200 Scots. In the early part of the month there were no arrivals from the latter country; and about 200 beasts were purchased in the metropolis for shipment to Aberdeen, chiefly, we believe, for contractors' purposes. The Irish supplies have been 1,550 beasts, 4,750 sheep, and 1,100 pigs *viâ* Liverpool; 285 beasts, 300 sheep, and 277 pigs by sea.

Beef has ranged in value from 3s. 4d. to 5s. 2d.; mutton, 3s. 4d. to 5s. 2d.; veal, 3s. 6d. to 5s. 4d.; and pork, 3s. 6d. to 5s. per 8lbs., to sink the offal.

COMPARATIVE PRICES.

	Nov. 1854.	Nov. 1853.
	s. d. to s. d.	s. d. to s. d.
Beef..... from	3 4 to 5 2	2 6 to 4 6
Mutton.....	3 4 5 0	3 0 5 2
Veal.....	4 2 5 6	3 4 4 8
Pork.....	3 4 5 0	3 4 4 10

Newgate and Leadenhall markets have been very extensively supplied with all kinds of meat; and a full average business has been transacted, as follows:—Beef, from 3s. 2d. to 4s. 6d.; mutton, 3s. 4d. to 4s. 6d.; veal, 3s. 6d. to 4s. 10d.; pork, 3s. 4d. to 5s. 4d. per 8lbs. by the carcase.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANBURY MONTHLY FAIR was very well supplied with store cattle. The fat beef trade of good quality was firm, but inferior animals were slow of sale at reduced prices; the average prices obtained were from 4s. 4d. to 4s. 6d. The stores declined in value, and were a heavy market. The sheep fair was also well supplied, but a hanging trade, at 4s. for ewes, and shearhogs 4s. 6d. per 8 lbs, some remaining unsold at the close of the day.

BATTLE FAIR was abundantly supplied with stock, and the attendance was beyond the average. Business was brisk, but at lower rates than last year.

BRECON FAIR.—In the horse and cattle fair, prices showed a considerable fall, it being estimated that stock was fully 20 per cent. lower than at our last fair. Even at these reduced prices comparatively few animals changed hands, the inferior description especially hanging on hand, but the few specimens of good horses shown soon met with buyers, while good conditioned horned stock also met with a ready sale.

BROOMFIELD FAIR.—A good supply of sheep, and a number changed hands; prices were lower. The horse fair was very thinly attended, and the business done was very slack.

CASTLE-DOUGLAS FAIR.—As usual, for years past, the dealers had come round and scoured the whole country, and purchased the greater number of horses for sale some ten days or a fortnight before the fair-day; and, consequently, all we could see of horse purchases was in the stables, on being delivered, or on their way—tied neck and heel, in threes, and fours, and fives—to the Dumfries market on Wednesday; still there were many horses, more than the ordinary number, exhibited on the market-hill. The demand was brisk, and prices have not certainly diminished since last September fair. First class draught horses at this fair have fully obtained former prices, say from £50 to £55; lower descriptions varied from £40 to £45. Mr. Muir, of Lochfergus, in this neighbourhood, a good breeder, sold a pair for 80 guineas, even cash; and his relative, Mr. Muir, of Banks, perhaps a more experienced breeder than even his son, got "even cash," exclusive of "luck penny," to the amount of £55, for a six-year-old saddle horse, although this class was not much in demand.

DAVENTRY FAIR was thinly attended, and trade generally was somewhat depressed. Good beef was sold at 6d. per lb.; the best mutton barely exceeded 6½d.

DONCASTER FAIR.—It may be fairly questioned if ever a larger or better show of stock was exhibited on any previous occasion. The scarcity of turnips and other food in the south has evidently thrown upon the north country markets a great number of cattle, which would, but for this deficiency, have found purchasers elsewhere. At the opening of the fair, trade was somewhat brisk; but purchasers finding the quantity offering more numerous than buyers' wants, prices later on gave way, and at the close many were left unsold. Cows and calves were much inquired after, and few on offer. In-calvers were also good to sell. Of sheep there was only an indifferent show, and sales were slowly effected. With the exception of two or three Irish droves, scarcely a good horse was to be found, and for all descriptions lower prices were taken.

DUNSE FAIR.—The show of shorthorned cattle was about an average. Immediately after the arrival of the trains from Berwick and Edinburgh a stimulus was given to the market, but previous to that time trade was dull. Good-conditioned beasts of the shorthorned breed sold very readily after at about five per cent. better than at Hallow fair, more particularly stirks, for which there appeared to be a demand. There were fine two-year-olds comparatively, but what was in anything like condition met an equally ready sale as stirks, but the inferior kinds were no better than at Hallow fair. The shorthorned three-year-olds ran from £12 10s. to £14; two-year-olds from £11 to £12; stirks from £7 to 10 5s. The bulk of this stock was all picked up. The following are a few of the sales:—Mr. Ruddock sold his best stirks to Mr. Reid, Hillside, Dunse, at £10 5s. The same gentleman also bought a lot of two-year-olds from Mr. Currie at £11. A few sales of shorthorned stirks were effected by Mr. Thomas Wightman, Northumberland, at from £8 to £8 10s. Mr. Stott, salesman, Newcastle, sold a lot of half-year-old calves at about £4 a-piece. Mr. Currie, Darlington, sold his stirks at from £7 to £9 10s., and his two-year olds at £10 10s. to £12 10s.; this dealer says his prices in some instances would be fully 5 per cent. higher than at Hallow fair. Mr. Wilkinson sold his stirks, shorthorns, at £8 10s., £9 9s., and £10 10s. At the close of the market a few of this kind of stock was turned out unsold.

EAST WITTON FAIR.—A great number of buyers in attendance. The show of stock was large, and was nearly all sold at higher prices than those obtained lately.

GARSTANG FAIR.—The supply of English, Irish, and Scotch cattle on the Thursday was good, and the quantity shown of the two latter descriptions was more numerous than for several years past. English cattle sold well and readily, present calvers fetching from £12 to £24 10s., and gelt stock from £7 to £12 per head. Scots were sold from £4 10s. to £7 10s., the latter being, of course, very superior animals. The horse fair, on Friday, was likewise very fully supplied, and among the latter were many animals of a much higher class than wont to be seen on such occasions, the prices for the better sorts quite equalling those obtained at any recent fair.

HAYWARD'S HEATH FAIR.—There was not so good a show of pigs as usual, and they sold briskly at a dear rate, realizing somewhat unusual prices. The quantity of stock was small, and the quality of a most inferior description. A few very inferior horses were offered, but little or no business was done except in the pig line, which were pretty well cleared off.

HORSHAM ST. LEONARD'S FAIR was well supplied with Welsh beasts, and we should think more numerously than usual. Trade was remarkably dull, and particularly so towards the latter part of the day. We should think it must have been one of the most unprofitable fairs which the Welsh cattle masters have experienced for many years. The cautious manner in which the farmers made their purchases may be attributed to the high price of hay and corn, and the falling off in the root crops generally.

YORK FAIR.—The supply of lean beasts was above the demand; and there was a dull trade at prices tending downwards. The horse fair was very similar, in character, to the Soulmas fair. A few good horses were shown, which were in demand; but the bulk were of inferior character, and dull sale.

CALENDAR OF AGRICULTURE.

In fresh weather plough stubbles, with subsoiling for the next year's green crops. All soils are benefited by early winter ploughing; light lands are consolidated by lying at rest, and strong soils are pulverized by exposure. Plough also leys for Lent crops, and first those of a clayey nature. Cast up earths on roadsides to be made into composts with lime; cast open ditches; clean out water-courses; repair roads; raise new fences, and mend old ones, and continue furrow-draining so long as the weather allows.

Collect earthy and vegetable materials of all sorts for the manure pit; gather mud and earths from the roads for the compost heap; and at no time or season omit any opportunity, or neglect any quantity or substance, however small, that will add to the bulk of the most indispensable of all articles, in most cases more valuable to the farmer than money in his pocket.

Plant forest trees of all sorts; cut underwoods, and fill up vacancies by laying and planting; in hop countries, oak, ash, and willow are most suitable, especially the ash; be careful to keep the fences of plantations in efficient order to prevent trespass, than which nothing more clearly shows a slovenly management.

Flood meadows at proper times, and lay dry occasionally.

In some early places lambs will be dropped this month; provide commodious shelter, and give the ewes an abundance of succulent food.

In every opportunity of mild weather take up turnips, and lay the roots in store; give the tops to the store animals, as young cattle and idle flocks of sheep.

In hard frosts thrash and deliver grains; carry stones for buildings and for drains; collect earths, carry timber, fuel, and faggots, and dung from the feeding yards to the heaps in the fields. Litter the yards as emptied; spread all substances evenly and thinly, and keep the yards dry and comfortable.

The winter being now fairly set in, the live stock of all kinds require the most constant and vigilant attention. Provide ample littering, both in the yards and stalls. Give food in abundance, but no waste. Keep the steamer in constant work, and thus afford cooked food daily to cows, pigs, poultry, and the work horses. Give it fresh-prepared, and lukewarm; any acidification of food cannot be recommended. Strive by every possible means to have fresh turnips from the store pits daily; but in fresh weather they are best from the fields. The yards should be so constructed that all animals eat under cover, unless it be in very warm situations.

It is most essential that all crops and live stock be insured, which is now done so cheaply that any farmer who neglects such an easy and necessary precaution is wholly inexcusable. The buildings should be insured yearly by the landlord as his property, and the stock and crop by the farmer as his own. Farmers have, like other classes, an Insurance Institution for themselves, which make good the damages from hailstorms as well as from fire on the property of the farmer.

Some persons close the year's accounts at the end of the year; but the business of every kind is very much intermixed, and the month of May is preferable, when the crops and stock of the former year are disposed of, and the coming year has not offered any productions. That period best divides the yearly business.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF NOVEMBER.

Considerable excitement has continued in every department of the trade throughout the month of November, and at times great activity has manifested itself, particularly in the article of wheat, which has fluctuated considerably. And after every lull a brisk movement has taken place, prices always leaving off higher, and being such at times as to create much anxiety in the minds of those who have no desire to see extravagant rates obtained during the winter months, which must aggravate the distress of the poorer consumers in all parts of the United Kingdom. In some counties, leading agriculturists have set an excellent example by advancing the wages of their labourers without being first solicited to do so, in order to avert the threatened troubles of numerous families. Since harvest the farmers cannot be charged with withholding their corn from the consumers, for every thrashing machine has been fully engaged, and generally bespoke four or five deep: and this is likely to be the case for some time to come. And yet the supplies have not been in excess of the demand; and so great is the consumption, that it will be difficult to bring forward any description of grain in such abundance as to satiate the buyers, so as to induce them to leave off purchasing regularly.

The supply of English wheat at Mark-lane the first Monday of the month was very moderate from Essex and Kent, with not much offering from more distant counties; and a brisk demand was experienced, every description of home-grown commanding an advance of 2s. per qr.: the top price of red being 84s. per qr., and of white 92s. per qr. Prices of all foreign wheat were rather higher, particularly choice Dantzic, which brought 96s. to 98s. per qr., and fine Pomeranian red 88s. per qr. Other sorts in proportion; and the stocks are much reduced at the port of London, and extremely limited at every other port of the United Kingdom. The imports were very moderate, and consisted of 1,050 qrs. from Antwerp (this was not Belgian produce, but Danubian, which has been despatched to that port for naturalization), 100 qrs. from Gothenburg, 1,103 qrs. from Konigsburg, 1,170 qrs. from Rostock, 950 qrs. from Stockholm—making together 4,373 qrs., against 2,201 qrs. the corresponding week of last year. The London average registered 83s. 8d. on 4,138 qrs.; the general weekly average was 78s. 4d. on 141,708 qrs., against 60s. 7d. on 144,842 qrs. the corresponding week of last year—which exhibits a difference in quantity of only 3,034 qrs., whilst in price it is 17s. 9d. per qr. From this point the averages steadily advanced last year.

The quantity of English wheat brought forward at Mark-lane the second Monday of the month was again quite moderate from Essex and Kent; and that from distant counties, to come per rail, was mostly sold away from the London buyers to go into Yorkshire. The town millers took the Essex and Kent supply very freely, at 2s. to 3s. per qr. enhancement in value; old and the finest new red commanded 88s. per qr., and choice white 92s. per qr. There was a steady demand for foreign wheat, and most descriptions were 2s. per qr. dearer; the run, however, was principally on the secondary sorts. The imports consisted of 3,289 qrs. from New York, 405 qrs. from Philadelphia, and 1,860 qrs. from Rostock—making a total of 5,699 qrs., against 4,340 qrs. the corresponding month of last year. The London average registered 83s. 7d. on 6,151 qrs.; the general weekly average was 80s. 3d. on 126,367 qrs., against 68s. on 137,097 qrs. for the corresponding week of last year. The difference in quantity was thus 10,730 qrs., and in price 12s. 3d. per qr. In both respects the following returns of each year will steadily approximate nearer and nearer as the season advances.

There was a fair quantity of wheat brought forward from Essex at Mark Lane the third Monday; but that from Kent was very limited. The morning being damp, the condition of many samples was very soft, and this caused rather a slow trade in consequence: a few picked parcels of white were taken off in the early part of the day, at an advance of 1s. to 2s. per qr.; but all other sorts were purchased slowly at about former rates, and some quantity was left over unsold for future markets. There was little offering from distant counties—higher rates being obtained at home, or for consuming towns in the North. There was a fair demand for foreign wheat at very high prices. Select Dantzic and choice Rostocks have each touched 100s. per qr., and all other sorts in proportion. The imports consisted of 4,818 qrs. from New York, 40 qrs. from Carsborg, 110 qrs. from the East Indies, and 167 qrs. from Konigsburg—making a total of 5,135 qrs., against 2,194 qrs. the corresponding week of last year. The London average registered 84s. 5d. on 6,818 qrs. The

general weekly average was 80s. 5d. on 118,730 qrs., against 72s. 1d. on 114,174 qrs. the corresponding week of last year, showing a difference of only 4,556 qrs. in quantity, and but 8s. 4d. per qr. in price.

A moderate quantity of wheat was brought forward in Mark Lane the fourth week, from the near counties, the condition of which was very soft, and the town millers purchased it slowly, giving less by about 3s. per qr. than was obtained the previous Monday, on account of its being so much out of order. The samples were considerably deteriorated in value by the recent very damp state of the weather. The demand for foreign wheat was limited—factors generally expecting that old samples must be had to make a good quantity of flour, and the stocks being so much reduced, sooner or later the demand on this account must be materially improved. The imports consisted of 1,830 qrs. from Baltimore, 50 qrs. from Faaborg, 228 qrs. from Hambro', 196 qrs. from Landscrona, 2,996 qrs. from Philadelphia, 680 qrs. from Rostock, 200 qrs. from Stockholm, and 400 qrs. from Terceira—making a total of 6,580 qrs., against 9,379 qrs. the corresponding week of last year. Good useful red Essex and Kentish wheat made 84s.; fair white 90s. per qr.; selected samples of each about 2s. per qr. over these rates. The London average registered 86s. 11d. on 5,479 qrs. The general weekly average was 80s. 10d. on 126,465 qrs., against 72s. on 132,655 qrs. the corresponding week of last year.

There have been a good many changes in the value of flour throughout the month, and Norfolks have, as usual, fluctuated the most. The top price of town-made was 75s. per sack the first Monday in the month, and Norfolks were again held for 60s. The arrivals coastwise were 1,549 sacks, by the Eastern Counties railway 10,543 sacks, by the Great Northern 3,150 sacks, and from foreign ports 3,272 saeks. The highest quotation for American was 47s. per brl.

On the second Monday of the month prices were higher. The top price of town-made was put up 2s., being 77s. per sack. Norfolks were held at 61s. to 62s.; Spanish, 66s. to 67s.; fine brands of American, 45s. to 46s.; fancies, 47s. per brl. The arrivals coastwise were 1,315 sacks, by the Eastern Counties railway 13,216 sacks, by the Great Northern 3,648 sacks, and from America 12,881 brls.

At the third Monday's market country marks were taken off at more money, and Norfolks were held at 63s.; however, only 61s. bid; but on the Wednesday following, owing to increased supplies, some sellers forced Norfolks down to 59s. per sack, but on the Friday there were no sellers under 60s. The arrivals coastwise were 3,260 sacks, by the Eastern Counties railway 12,443 sacks, by the Great Northern 3,697 sacks, from foreign ports 1,902 sacks and 5,852 brls: the best brands of the latter were worth 47s. per brl.

The fourth Monday the trade was languid: the top price of town-made remained at 77s.; households, 68s. to 69s.; Spanish, 68s. to 69s.; country households, 63s. to 65s.; the best brands of American, 47s.; and Norfolks were more pressingly offered, and could not be placed beyond 59s. per sack. The arrivals coastwise were 1,778 sacks, by the Great Northern railway 3,874 sacks, by the Eastern Counties 12,341 sacks, from foreign ports 13,454 brls.—these came from Baltimore, New York, and Philadelphia.

There has been an excellent trade in barley throughout the month, notwithstanding the continued increase in the deliveries. At Mark Lane the first Monday the supply was short, and more money was generally obtained; the finest qualities commanded 45s. per qr., other sorts in proportion. The arrivals consisted of 2,853 qrs. coastwise, 71 qrs. from Scotland, 2,574 qrs. per the Eastern Counties, 338 qrs. by the Great Northern, and 33 qrs. from foreign ports—making a total of 5,563 qrs. Prices were enhanced 1s. per qr. on the second Monday of the month, with a good demand for all sorts: 46s. per qr. was the top price for fine malting qualities. The arrivals were 1,280 qrs. coastwise, 10 qrs. from Scotland, 2,197 qrs. by the Eastern Counties Railway, and 30 qrs. by the Great Northern—making a total of 3,517 qrs. A further advance of 1s. per qr. was obtained on the third Monday of the month, when 47s. per qr. was given for fine Chevalier samples. The arrivals were 1,752 qrs. coastwise, 20 qrs. from Scotland, 1,554 qrs. by the Eastern Counties Railway, and 47 qrs. by the Great Northern—making a total of 3,373 qrs. At Mark Lane the fourth Monday of the month there were four arrivals of English, and for the choicest samples of malting a steady trade was experienced at full prices; for very choice quality, 48s. per qr. was the rate obtained, and all other sorts in proportion, although light descriptions were easier to purchase. The arrivals coastwise were 3,580 qrs., from Scotland 40 qrs., by the Eastern Counties 3,958 qrs., by the Great Northern 68 qrs.—making a total of 7,646 qrs. The general averages have been 38s. 6d. on 67,480 qrs.; 39s. on 72,366 qrs.; 39s. 6d. on 77,242 qrs.; 39s. 11d. on 93,931 qrs.

There have been good deliveries of beans throughout the month, and prices of all sorts have not only been well maintained, but have generally advanced; for fine qualities of old English very high prices have been supported; and for the driest parcels of new, quite remunerating rates have been

obtained. Feeding stuffs of all kinds being so exorbitant, there is no prospect of this article being reduced in value during the winter months, the more so as the imports from Alexandria have been very moderate, and are likely to continue so for some time to come; and this description has maintained good prices and ready sales at all the principal ports of the United Kingdom, the consumption now being large, and likely to be kept up. The arrivals the first Monday of the month were 796 qrs. coastwise, 667 qrs. by the Eastern Counties Railway, and 136 qrs. from foreign ports. The second week the supplies were 318 qrs. coastwise, 644 qrs. by the Eastern Counties Railway, and 602 qrs. from foreign ports. The third week the arrivals were 339 qrs. coastwise, 227 qrs. by the Eastern Counties Railway, and 1,189 qrs. from foreign ports. The fourth week the arrivals were 711 qrs. coastwise, 298 qrs. by the Eastern Counties Railway, 15 qrs. by the Great Northern, and 2,152 qrs. from foreign ports. The general averages were 51s. 3d. on 5,257 qrs.; 50s. 8d. on 4,963 qrs.; 51s. 11d. on 4,993 qrs.; and 52s. on 5,496s. qrs.

Like every other article of grain, peas have steadily improved in value almost every week in the month, with an increased demand for all sorts, but particularly for good boiling blue as well as white. The former description is much wanted as a substitute for "green pease" in Scotland, and fine imperials bring very high prices, the demand being greater than the supply of this favourite sort. During the month there have been moderate imports into London; but on the east coast, and particularly at Leith, the arrivals have been very large, and there prices have in consequence been scarcely supported. Fine white boilers are worth 58s. to 60s. per qr., and choice blues, 68s. to 72s., and even higher for an improved large-sized imperial. The arrivals coastwise the first week were 346 qrs., by the Eastern Counties Railway 244 qrs., by the Great Northern 40 qrs., and from foreign ports 2,775 qrs. The second week there were 303 qrs. coastwise, 204 qrs. by the Eastern Counties Railway, and 1,326 qrs. from foreign ports. The third week, 632 qrs. came coastwise, 186 qrs. by the Eastern Counties Railway, and 625 qrs. from foreign ports. The fourth week the arrivals were 570 qrs. coastwise, 144 qrs. by the Eastern Counties Railway, and 2,062 qrs. from foreign ports. The general averages were 49s. 9d. on 1,532 qrs.; 51s. 2d. on 2,718 qrs.; 51s. 4d. on 2,536 qrs.; and 50s. 4d. on 2,651 qrs.

The imports of foreign grain for the month ended the 31st October, as published in the *London Gazette* of the 13th October, were 390,182 qrs. grain and 127,882 cwt. flour, against 201,160 qrs. grain and 29,066 cwt. flour in the corresponding month of last year; and the different sorts stand thus—viz.:

	1854. Qrs.	1855. Qrs.
Wheat	75,517	132,772
Barley	10,474	4,845
Oats	26,864	52,438
Rye	23	31
Beans	31,496	22,165
Peas	15,054	5,659
Maize	41,732	172,268
Buckwheat ..	—	4
Total....	201,160	390,182
Flour.....	29,066 cwt.	127,882 cwt.

The imports of the present year, during the month of October, show a considerable excess over those of the same month last year, as America had then nothing to spare; and now the arrivals from thence have begun, but will be larger next than the present month. Afterwards, they may not prove so much as was expected soon after their harvest, as other countries have been the highest bidders for breadstuffs, and have taken the greatest quantities away up to this point.

From the north of Europe, our advices indicate exhausted stocks and high prices. At Danzig some excitement has been experienced where large purchases have been made of old qualities of wheat for the interior at extremely high prices, whilst the quality of the new is so inferior as to give expectation of imports being required, instead of exports being continued.

At Rostock supplies are limited in the extreme. Two or three cargoes of middling qualities of wheat commanded 84s. per qr., cost, freight, and insurance included. 62lb. must now be considered worth 87s.; 61lb., 85s.; and 60lb., 83s. per qr., free on board.

Very high prices have been paid for wheat at Hamburg, where the stocks are very low. Light 58½lb. to 59lb. marks brought 86s.; 59½lb. to 61lb. Mecklenburg, 85s. to 87s. 6d.; 58½lb. to 60½lb. Holstein wheat realized 84s. to 85s. per 480lb. At these prices, 4,000 qrs. have just changed hands at that port.

From the outports, for immediate shipment, 59lb. to 60lb. Danish wheat commanded 80s. to 81s. 6d. per qr. For spring shipment there was more demand; and several cargoes have changed hands at the following rates: 59½lb. half kilndried Jutland at 85s. 6d. Holders now ask for 59lb. to 60lb. partly kilndried and fresh Danish 85s. to 86s. 6d.; 59½lb. to 60½lb. Holstein and Sleswick, 86s. 6d. to 87s. 6d. per qr. free on board, which is an advance of 3s. to 4s. per qr. within the week.

In barley on the spot there has been very little doing, holders demanding for good Danish 46s. to

46s. 6d. per 448lb. Outport shipments for immediate delivery, with vessels engaged, have met a brisk demand. 3,000 qrs. of 52lb. to 52½lb. Danish have been sold at 42s. to 42s. 6d., cost and freight to the east coast included. For spring shipment, 9,000 qrs. have just changed hands—51lb. to 53½lb., from the east coast of Denmark, at 40s. to 41s. 9d.; 52lb. to 52½lb. at 41s.; and 49½lb. to 50lb. Swedish at 37s. 6d. per imperial qr., free on board.

Oats on the spot were selling at 30s. to 31s. per 336lb., free on board. Outport shipments for autumn delivery are neglected, for want of ships. For spring shipment there was a better demand, and about 3,000 qrs. have changed hands, for which the following prices have been paid: 39lb. east coast of Jutland, 27s.; 36lb. to 37lb. black west coast, 25s.; and 39lb. to 40lb. Emden brew, at 27s. per imperial qr., free on board; and at these prices there are still sellers.

The stocks of beans have been rapidly cleared off, not only for English account, but for the interior of Germany; and as the navigation is almost closed, from some smart frosts, no additional supplies can be expected. At present there are eager buyers at 47s. 6d. to 48s. per 504lb., free on board.

Peas are inactive; and prices on the spot were 54s. to 55s. per 504lb., free on board; and from Denmark, 50s. per imperial qr.

The Dutch markets continue very high, and there has been recently an advance of 2s. to 3s. per qr. on all good qualities of wheat; for white Zealand 88s. to 90s. per qr. had been obtained at Rotterdam. Rye has commanded a quick sale, and samples of American have realized 69s. to 70s. per qr., and English brought 68s. to 69s. per qr. Beans were worth 49s. to 50s. per qr.

The Belgian markets have steadily advanced, and prices of all good wheat have been very high.

Until within the last week the French markets have been languid and depressed, but a reaction has set in, and prices are now on the advance again for both wheat and flour. The prices of the last article at Paris, on the 26th of the month, were up to 109 f. 50 c. to 110 f. per sack of 159 kilos., for immediate delivery, equal to about 73s. to 74s. per sack of 280lbs. The sales on that day amounted to 4,183 quintals 68 kilos., and the stocks were 21,943 quintals 61 kilos. The imports from America are arriving steadily at the outports, but not yet extensively, and these meet sales at fair prices as they continue to drop in. There has been no great demand for wheat, and prices are just on the turn upwards; in the last week an enhancement in 26 country markets took place, and at only 7 there was a slight decline, and purchases in England have now commenced again.

Much controversy has latterly taken place about the crop of wheat grown in England this year, and strong efforts have been made to prevent merchants entering into purchases in any quarter of the globe, and this may prove very injurious to the consumers sooner or later; and before spring shipments can take place, the pinch may come, and the agriculturists will then most probably reap the benefit when the supplies will be most wanted. Some parties fancy the farmers have withheld their corn from the markets, but it is well known by those who visit the various country districts that every thrashing machine has been fully engaged, and mostly bespoke four or five deep, and with great favour can any be secured when wanted.

At present the thrashing of barley is proceeding with the greatest activity, and for the first time since harvest the supplies of this article have exceeded the demand, and a decline was reported at the last Monday's market of the month, when an abatement of 1s. to 2s. per qr. was accepted, principally, however, confined to middling and secondary sorts. The thrashing of oats, beans, and peas will go on more extensively now that the beasts are being brought into their winter quarters, and the consumption will be very extensive throughout the winter months, from the very high price of every description of feeding stuffs, particularly of linseed cakes, the best sorts of which are worth 14*l.* to 14*l.* 10s. per ton.

At New York the supplies of wheat have been more limited than anticipated. Latterly the condition has somewhat improved, as well as the quality. Good white Canadian wheat has sold at 72s. to 80s.; Delaware at 69s. to 72s.; mixed Illinois, 71s. to 75s.; red Southern at 64s. to 75s.; Kentucky, 67s. to 72s.; Western and Upper Lake red wheat 65s. to 75s., according to quality, all per 480lbs. Home millers restrict their purchases, as these rates are relatively higher than flour. Supplies of this month promise to be large, as cold weather must have materially improved the condition in which wheat was harvested. Ohio wheats have appeared, but quality, so far, is not very desirable. Red Missouri and Southern Illinois, however, are satisfactory in this respect. Considerable activity is manifested along the route of western transport, forwarding supplies to the Atlantic seaboard previous to the closing of the navigation. Delay is now attributable to the inferior condition of western wheats at harvest; there is no prospect of any immediate pressure among the receivers of produce from the Western States, on account of the period for closing the navigation being at hand.

The receipts of wheat per canal from 1st Sept.:—

	1853. Qrs.	1854. Qrs.	1855. Qrs.
September, 4 weeks ..	186,033	24,290	64,526
October, 1st week	47,220	9,252	40,152
„ 2nd „	66,104	8,726	43,757
„ 3rd „	89,860	5,355	62,426
„ 4th „	46,801	15,801	71,980
November, 1st week ..	41,138	10,975	48,951
Total	477,156	74,399	331,792

Those who have been anxious to prove that America will be enabled to supply such prodigious quantities, have compared the shipments this year with those of last, when that country had nothing worthy of notice to spare; whilst, if they glance to the shipments of the previous year, as above, they will see that 1855 falls far short of 1853. Mr. Caird is one of those gentlemen ! !

The receipts of Flour have been liberal at New York—demand for export as well as local speculation animated. On the 3rd of November, prices of common to good State were run up to 42s. per brl. free on board; this excitement was of short duration. A stringent money market, with lower European advices, caused a rapid decline to 37s. and 38s. per brl. free on board for some qualities, other grades receding in the same proportion. On the 10th, prices again rallied to 37s. 6d. and 38s. 6d. per brl. free on board. The qualities branded No. 1 superfine have disappointed the receivers in England. This from the onset was pointed out by some parties across the Atlantic, simply from the fact of their being made of sprouted wheat by the Western millers, who could not afford to use the best and soundest samples at their high currencies; and thus they have preferred profit to giving the consumers satisfaction. Superfine Ohio brands are recommended to these Western-canals, and English buyers will do well to look out for such.

Receipts of Flour per canal since 1st of September were—

	1853. brls.	1854. brls.	1855. brls.
September, 4 weeks	314,001	80,674	95,437
October 1st week	83,645	40,875	44,596
„ 2nd „	113,823	52,126	46,102
„ 3rd „	219,028	42,240	100,260
„ 4th „	139,197	88,873	85,542
November 1st „	97,121	78,599	86,852
Total	966,815	383,387	458,789

The exports do not exhibit so great a difference in this as the past year as did those of wheat, but if compared with those of 1853 they do not amount to one-half; and it is thus, we think, very evident that the exports of the cereal year from the 1st of September last will prove far short of those shipped in 1853.

The supplies of Indian corn have continued on a moderate scale. Export demand has been trifling; but although somewhat increasing, home consumption has helped to maintain prices. Fluctuations have consequently been few, without much interest to the shippers. The highest price paid within the fortnight for Western high-mixed was 37s. per 480lbs. free on board, and decline subsequently does not exceed 6d. per qr. Small parcels of new yellow had arrived from the south, the condition of which was still too damp for shipment. Contracts for future shipment from January to March continue to be made at 32s. to 34s. per 480lbs. free on board, but the inquiries have not latterly been well kept up. During the winter months liberal arrivals of new yellow or pure white Indian corn may be expected, as usual, in fine shipping condition from North Carolina, Virginia, Maryland, and Pennsylvania, where crops are most abundant, as well as of superior quality. The best season to purchase may be January, February, and March. The receipts per canal since the 1st of September were, in 1853, 138,858 qrs.; in 1854, 587,012 qrs.; in 1855, 427,839 qrs. The stock of western or high-mixed—at the last date of their advices, say the 14th of November—was variously estimated at from 150.000 to 160,000 qrs.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter
Wheat, Essex and Kent, white, old..	76 to 90 extra 92 94
Ditto new .	67 87 „ — —
Ditto, red, old .	78 82 „ 86 90
Ditto, new .	62 80 „ — —
Norfolk, Linc. and Yorksh., red, old	80 86 „ 87 89
Ditto, new	60 78 „ — —
Barley, malting, new..	40 42 .... Chevalier.. 43 46
Distilling....	40 42..... Grinding .. 37 40
Malt, Essex, Norfolk, and Suffolk....	76 78 extra 84
Kingston, Ware, and town made..	77 80 „ 84
Brown.....	66 71 „ —
Rye	— — 50 52
Oats, English feed..	27 28 ..... Potato.. 28 35
Scotch feed, new	29 31, old 34 35 .. Potato 34 35
Irish feed, white	25 26 fine 28
Ditto, black	23 25 „ 28
Beans, Mazagan.....	41 42 „ 42 45
Ticks.....	41 46 „ 45 47
Harrow.....	43 46 „ 45 48
Pigeon	48 53 „ 54 56
Peas, white boilers	50 55.. Maple 42 47 Grey 43 45
Flour, town made, per sack of 280 lbs.	— — 75 77
Households, Town 65s. 67s. Country	— 60 62
Norfolk and Suffolk, ex-ship	— — 58 59

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Oct. 13, 1855..	76	7	38	4	28	6	49	8	49	11	48	7
Oct. 20, 1855..	76	10	38	10	27	9	50	5	49	10	48	7
Oct. 27, 1855..	78	4	38	6	28	8	50	1	51	3	49	9
Nov. 3, 1855..	80	3	39	0	28	0	51	3	50	8	51	2
Nov. 10, 1855..	80	5	39	6	28	4	52	1	51	11	51	4
Nov. 17, 1855..	80	10	39	11	28	0	52	10	52	0	50	4
Aggregate average of last six weeks	78	4	39	0	28	3	51	1	50	11	49	11
Comparative avge. same time last year	64	6	32	10	27	0	38	0	46	8	44	2
Duties	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Av. s.	Av. d.	Averages from the corresponding *Gazette* in 1854.	Qrs.	Av. s.	Av. d.
Wheat....	126,465 ..	80	10	Wheat....	132,655 ..	72	11
Barley....	96,931 ..	39	11	Barley....	85,434 ..	34	7
Oats	19,029 ..	28	0	Oats	15,778 ..	28	4
Rye.....	289 ..	52	10	Rye.....	347 ..	41	2
Beans....	5,495 ..	52	0	Beans....	4,776 ..	49	2
Peas	2,651 ..	50	4	Peas	2,465 ..	49	8

PRICES OF SEEDS.

BRITISH SEEDS.

Tares, winter (per bushel)..... 6s. 6d. to 7s. 6d.
Coriander (per cwt.)..... 20s. to 24s.
Carraway (per cwt.).... new .. s. to 50s., old .. s. to .. s.
Canary (per qr.)..... 63s. to 68s.
Hempseed (none)..... 00s. to 00s.
Linseed (p. qr.) sowing .. s. to .. s., crushing 78s. to 85s.
Linseed Cakes (per ton) ..... £14 10s. to £15 0s.
Rapeseed (per qr.) ..... new 90s. to 94s.
Ditto Cake (per ton)..... £7 10s. to £8 0s.

FOREIGN SEEDS, &c.

Hempseed, small, (per qr.) .. s. 56s., Ditto Dutch, 58s.
Coriander (per cwt.)..... 15s. to 20s.
Carraway ..... 42s. to 46s.
Linseed (pr qr.) Baltic, 76s. to 79s.; Bombay, 81s. to 84s.
Linseed Cake (per ton)..... £13 10s. to £14 10s.
Rapeseed, Dutch ..... 90s. to 94s.
Rape Cake (per ton)..... £7 10s. to £8 0s.

HOP MARKET.

BOROUGH, Monday, Nov. 26.

Since the announcement of the duty, our market has improved in demand for fine and middling qualities, for which rather more money is obtained. Inferior and brown samples remain without much inquiry.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Monday, Nov. 26.

During the past week the arrivals coastwise have been limited, but very large by rail; trade has been heavy, particularly for second-rate stuff or parcels that are affected with blight. The following are this day's quotations:

	s.	d.		s.	d.
York Regents	90	0	to	110	0
Kent and Essex do.	90	0		100	0
East Lothian do.....	80	0		95	0
Perth, Forfar, and Fifeshire do.	50	0		85	0

BOROUGH AND SPITALFIELDS.

Monday, Nov. 26.

Large supplies of potatoes arrived up to these markets last week coastwise and by railway. Those from Scotland were in very inferior condition. The imports from abroad were trifling, viz., 38 packages from Rotterdam, 6 bags from Guernsey, 2 hampers from Amsterdam, together with 3 bags from Ireland. We have a slow trade as follows:—York Regents, 100s. to 110s.; Scotch do., 90s. to 100s.; inferior kinds, 65s. to 70s.; Lincolns, 80s. to 90s.; Essex and Kent qualities, 80s. to 100s.; blues, 80s. to 90s.; Shaws, 75s. to 95s. per ton.

COUNTRY POTATO MARKETS.—York, Nov. 17.—We had a good supply of potatoes of excellent quality. They sold at from 7d. to 8d. per peck—2s. 4d. to 2s. 6d. per bushel. Leeds, Nov. 20.—A moderate show of potatoes sold at from 9d. to 9½d. per 21 lbs. wholesale, and 10d. to 10½d. retail. Malton, Nov. 17.—A good supply of potatoes sold at from 2s. 2d. to 2s. 4d. per bushel. Thirsk, Nov. 19.—Potatoes, 6d. per stone. Richmond, Nov. 17.—Potatoes, 2s. 8d. per bushel. Manchester, Nov. 20.—Potatoes, 7s. to 11s. per 252 lbs.

ENGLISH BUTTER MARKET.

November 26.

With a firm Butter Market, we have anything but an active trade.

Dorset fine..... 116*s. to* 118*s. per cwt.*
Do. middling ..... 106*s. to* 108*s.* „
Devon..... 108*s. to* 110*s.* „
Fresh..... 11*s. to* 15*s. per doz.*

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	*s.*	*s.*	*Cheese, per cwt.*	*s.*	*s.*
Friesland	110 *to*	114	*Cheshire* .... *new*	70 *to*	84
Kiel.....	100	110	*Cheddar* ..... „	74	80
Dorset, new	110	116	*Double Gloucc.* „	66	76
Carlow	108	110	*Single do.* .. „	60	70
Waterford	98	102	*Hams, York*	96	108
Cork, new	94	106	*Westmoreland.* „	94	104
Limerick	98	102	*Irish* ..... „	90	98
Sligo	94	102	*Bacon, Wilts., dried..*	76	80
Fresh, per doz. 13s. 0d.	15s. 0d.		*Irish, green*....	68	70

BELFAST, (Friday last.)—Butter: Shipping price, 98s. to 106s. per cwt.; firkins and crocks, 10d. to 11d. per lb., Bacon, 60s. to 66s.; Hams, prime, 84s. to 90s., second quality, 66s. to 70s. per cwt.; prime mess Pork, 92s. 6d. to 95s. per brl.; beef, 105s. to 140s. per tierce; Irish Lard, in bladders, 72s. to 74s.; kegs or firkins, 66s. to 68s. per cwt.

Nov. 23.	*Butter. per cwt.* s.	d.	s.	d.	*Bacon. per cwt.* s.	d.	s.	d.	*Dried Hams, per cwt.* s.	d.	s.	d.	*Mess Pork. per brl.* s.	d.	s.	d.
1851..	77	0	84	0	45	0	47	0	60	0	62	0	56	0	58	0
1852..	76	0	82	0	50	0	54	0	64	0	66	0	72	6	75	0
1853..	95	0	100	0	54	0	58	0	70	0	76	0	85	0	87	6
1854..	90	0	95	0	54	0	60	0	68	0	74	0	90	0	95	0
1855..	98	0	106	0	60	0	66	0	84	0	90	0	92	6	95	0

GLOUCESTER CHEESE FAIR.—There was a good supply from the surrounding noted dairies of Gloucestershire, and the attendance of buyers was also numerous. About 120 tons of cheese were pitched, most of good quality and in excellent condition; but the trade was languid, and the late high prices given for Gloucestershire cheese were not obtainable. The following were the prices at which sales were effected, but several of the best lots remained unsold at the close of the market:—Best double Gloucester, 63s. to 65s. per cwt.; single, 56s. to 60s.; seconds, 48s. to 52s.; and skim cheese, 30s. to 34s. per cwt.

ENGLISH WOOL MARKET.

Bermondsey, Nov. 24.—There is no material alteration in either demand or price of English wool. We have rather more enquiry for Southdown fleeces, at late prices. Longwool fleeces, being more plentiful, are stationary as to price and demand. Dear provisions and the high price of discounts make the home trade slack, and business dull. We have more enquiry just now for skin wool, at a trifling advance for good assortments for flannel wools. The market is tolerably well supplied with skins and wool, for the season.

LIVERPOOL WOOL MARKETS, Nov. 24.

Scotch Wool.—There is a rather better demand for laid Highland Wool from the trade, but they still buy with extreme caution. White Highland is in fair demand. In crossed and Cheviot there has been less doing. The report of the public sales in Edinburgh having gone off flat, and at very decidedly lower prices, our business is checked here in these kinds.

END OF VOLUME XLIII.

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